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Contents . . March 18, 1935

Volume 96 • Number 11

AS THE EDITOR VIEWS THE NEWS 21

Basing Point in Politics: Two Opposing Reports 22

Breakdown of Steel Capacity by Products, Cities 24

NEWS OF THE WEEK:

Meetings	26	Financial	28
NRA	26	Foreign Trade	28
Steel in the News	26	Safety	28
Labor	26	Transportation	28
Production	27	Users', Makers' Activities	88

Windows of Washington 29

Mirrors of Motordom 31

Industrial Men in the Day's News 33

Obituaries 34

EDITORIAL—Tinkering with Basing Point System 35

THE BUSINESS TREND 36

ENGINEERING DEVELOPMENTS:

Brass Die Castings	38	Perforated Metal Sheets	49
All-Welded Dam Penstocks	40	Tin Plating of Pistons	50
Studies of Steel Slags	41	New Automotive Brake	52
Methods and Materials	43	Factors in Steel Scrap	54
Value of Platings	43	Liquid Carburizer	56
Uses for Carbide Residue	45	Woven Welding Wire	58
Forming Steel Trademarks	46	Progress in Steelmaking	59
A.S.T.M. Committee Work	47	New Equipment	63
Combination Power Unit	48	Trade Publications	68

MARKET REPORTS AND PRICES 69-88

CONSTRUCTION AND ENTERPRISE 91

ADVERTISERS' INDEX 98

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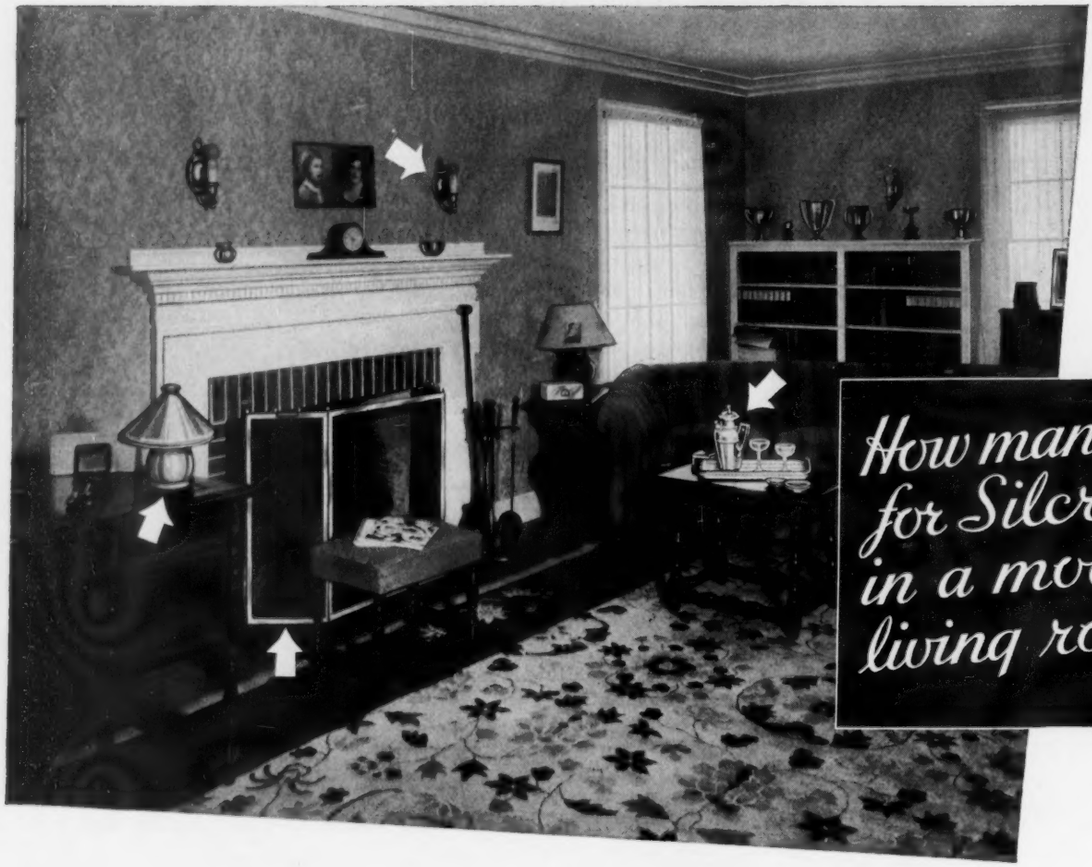

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There are no "rules," no "entry blank" to this contest. Merely write your list plainly, sign your name and address, and mail to Ludlum Steel Company, Watervliet, N. Y. No entries returned, all becoming the property of the Ludlum Steel Company to use as they see fit. Impartial judges have been selected, and their decision will be final. Contest closes April 30, 1935, so send in your lists as soon as possible. You may win several prizes! And remember, a valuable booklet will be given to every contestant—win, loose or draw!

Here are the 15 classes

1. Automotive and Aviation
2. Railroads
3. Marine
4. Chemical processing equipment
5. Food and beverage processing
6. Food and beverage dispensing (serving)
7. Machinery and parts
8. Electrical apparatus and appliances
9. Medical and dental equipment
10. Building and construction
11. Sporting goods (and toys)
12. Hardware and tools
13. *Household*—kitchen and dining room equipment
14. *Household*—furniture and furnishings
15. Personal use and adornment (miscellaneous)

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As the Editor Views the News

TWO years ago the brain truster advisers to the new deal administration were proclaiming loudly the virtues of a "planned economy" which they had concocted to lead the country out of the depression. Professor Somebody had devised an elaborate chart showing step by step, with dates, exactly how we were to be marched out of the wilderness of depression into the promised land of prosperity. It was a glorious panorama they displayed before the gullible American public. The idea that everything was to proceed smoothly according to plan sounded good to the troubled man in the street. He fell for it hard.

• • •

Today there are signs that he is pretty well fed up with this highly touted brand of economy. He is not so sure that reckless experiment—juggled by politicians—will solve our problems. He is beginning to renew his faith in the old fashioned virtues of thrift and industry. He is decidedly more conservative than the President, the cabinet, the senate or the house. Congressmen are becoming aware of this undercurrent of public opinion and gradually are emerging from under the hypnotic spell of the glamorous new deal. Today a planned economy is hopeless; there are too many rival, head-strong, would-be planners.

Too Many Planners

• • •

Now that the public is becoming disillusioned, there is hope that some of the errors perpetrated under a planned economy will be corrected. The weight of public opinion is the most potent political factor. Its pressure will shape the policies of the new deal during the remaining two years of its present term. Obviously, it behooves the Roosevelt administration to move heaven and earth to produce tangible results in terms of sustained, far reaching recovery. New dealers have tried virtually everything except the obvious and logical remedy. Sooner or later, unless they deliberately court disaster, they will see that the success of recovery demands a policy which aids and encourages business to make a profit. They will fail if they continue to harass, defame and undermine private enterprise.

Stop Panning Industry!

• • •

Convincing proof of the inept and absurd functioning of a politically planned economy is furnished by the conflicting reports (pp. 22 and 35) on steel's basing point system. One government agency proposes that the existing pricing system be destroyed. The other asks that it be continued in principle, but with radical changes. Both pit their limited, superficial knowledge of the subject against the experience of producers and consumers who have lived with the problem day and night for years. No one has ever claimed that the multiple basing system is perfect. Nevertheless it is a far better plan than any of its predecessors. The public interest will be served better by steady improvement and evolution of the existing practice than by foolhardy experiment with untried schemes.

U.S. Playing with Dynamite

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Turning to a more cheerful aspect of the business situation, we note that industrial activity is more than holding its own against great political odds. STEEL'S index (p. 36) has recovered much of the ground lost a few weeks ago. Another rise is due for the week ending March 16, caused partly by an unusual spurt (p. 32) in automobile assemblies. And right here, let it be said that the industries now leading the procession in recovery are those which have shown the most marked indifference to the activities of the Washington planners of economy. The automobile people have been singularly successful in standing up for their rights. Possibly that is one of the principal reasons why they are so far ahead of many other industries.

Autos Still Lead Procession

E. L. Shaner

Basing Point System Is Eased into Politics as Opposing Reports Go to President

SOME revision of methods of quoting iron and steel may result from the issuance last week of voluminous reports by NRA and the federal trade commission on the basing point system, almost simultaneous with the introduction in congress of bills to outlaw so-called Pittsburgh-plus.

The extent of this adjustment apparently hinges upon two main factors—the degree to which President Roosevelt is swayed by the reports and his reaction to the industry, and the distance producers are willing to go to placate the administration and public sentiment.

Out of a welter of almost 100,000 words, accompanied by exhaustive charts and statistical data, released by NRA and the trade commission, and also by the American Iron and Steel institute in rebuttal, the following concisely states the present situation:

To mollify antitrust sentiment in congress and growing criticism of price provisions sanctioned by NRA, the President in extending the steel code last May 30 directed NRA and the trade commission to study steel pricing methods and submit a joint report by Dec. 1.

Efforts by Co-ordinator Richberg to harmonize the two reports having failed, these reports were released last week as separate documents. Thus the President has before him the two individual reports.

Favors Only F.o.b. Prices

The trade commission, long a foe of the iron and steel industry, has presented a smashing attack upon present pricing plans. Although the number of basing points specified in the steel code is many times that sanctioned by the commission at the conclusion of its Pittsburgh-plus proceedings in 1924, the commission will be satisfied with nothing less than f.o.b. prices at every producing point.

The trade commission specifically urges the President to eliminate from the steel code all sanction to the multiple basing point system, provisions in aid of price fixing, and provisions relating to regulation of production and new capacity. The implication is that if the industry continues on the present basis in event the code is thus modified, either the trade commission or the department of justice, or both, will institute actions under the Clayton and Sherman acts.

NRA, defending its code from most of the trade commission's shafts nevertheless concedes some improvement is desirable to lend incentive to producers to lower their base prices as a means of extending sales areas, to minimize wasteful competitive cross-hauling, and to curb absorption of freights.

The specific recommendation of NRA is that group mill bases be set up to embody all producers within 50-mile radii and that the absorption of freight in going outside natural competitive territory be limited to 25 cents per 100 pounds or $5 per net ton.

Thus the President now has on his desk one report blasting the present basing point system completely out of the water, and another proposing, as a minimum, mill group bases. Considering that the President has a deep-seated suspicion of steel costs and pricing, some action by him appears to be a foregone conclusion.

Under the national industrial recovery act, which is the basis for NRA codes, the President has the right "from time to time to cancel or modify any order, approval, license, rule or regulation." Industry has one alternative—to accept the President's dictum or to throw up its code.

The recent history of the steel industry discloses a disposition generally to go along with government. In August, 1923, after maintaining that the 12-hour day was inescapable, the iron and steel industry acceded to the request of President Harding and adopted the 8-hour day and 6-day week. After contesting the trade commission's Pittsburgh-plus proceedings for five years, the industry in September, 1934, inaugurated a multiple basing point system.

The steel code, with all others, expires on June 16. If NRA is modified and extended, as now proposed by the administration, all codes presumably will be automatically reopened. Considering that renewing legislation is now under consideration in congress, it seems probable that any revision would be withheld until the period of renewal, which is only 90 days distant.

In event NRA is not renewed or price provision are eliminated from all codes, as is possible, the industry is on notice by the trade commission that the present multiple basing point system will be attacked.

Expect Legislative Remedy

It is possible that the President, for strategic reasons and to appease those elements in congress and in the country which are for stricter application of the antitrust laws, may act swiftly, but the first reaction both in Washington and New York was that progress will be made slowly.

With two important governmental agencies definitely at odds on so crucial an issue, there was a belief in New York Friday that a controversy has been set up which, in the last analysis, can be settled only through the relatively slow routine of legislative action. In any event, any departure from the present system is not likely to be made effective prior to June 16.

W. Averill Harriman, administrative officer for NRA, said Friday that NRA has no immediate plans to amend the steel code at this time. However, he indicated the two basing point reports will be considered either in compiling a new steel code or revising the present one.

The political complexion of NRA and the trade commission may be a factor. Much of the radical legislation that has been sent up to congress by the administration has emanated from a young liberal group identified with the trade commission.

Recently, the President has not been very keen for NRA, but Co-ordinator Richberg, who is closest to

New Deal in Basing Points?

So far as known, President Roosevelt has never seen the inside of a blast furnace or steel plant, but he may be the arbiter of the most important issue facing the industry in a decade. He drove a hard bargain in 1933 when he forced down the price of rails. Has the necessity for promoting recovery prior to reform tempered him?

his ear and has been sitting on the steel code authority as a government representative, may be expected to throw his influence on the side of the NRA proposal.

Nor can it be forgotten that the tendency through many years of steel history has been to give the consumer a better break. The various pricing methods, ranging from the oldtime pools and zones, have been supplanted by a basing point system which has steadily been widened, and every departure in pricing in recent years has been toward a liberalization. The question now is whether the industry will make further concessions tending to soften the government's attitude.

While the President has never made any flat statement relative to basing points he has intimated a number of times that he thinks it would be just as well to abolish them. He would not comment on the reports Friday, saying he had had no chance to look them over.

The reaction in Detroit last week was that any change in the present system would be a decided boost to that area and tend to bring more steelmaking capacity to the largest single consuming point in the country.

May Retard Demands

Throughout the iron and steel markets there was an undercurrent of feeling among consumers that any changes would be to their advantage and hence the consumer had everything to gain and nothing to lose by holding back all but his most urgent requirements. This may have a bearish effect on steel production during the early part of the second quarter.

That the institute will strenuously combat the attack of the trade commission is evidenced by the following blistering statement issued by it Friday:

"In considering the commission's report it is important to consider the occasion for the report. In connection with the President's executive order of May 30, 1934, approving certain amendments to the steel code, the President stated that he had directed the trade commission and NRA to study further and jointly the operation of the basing point system and its effects on prices to consumers and any effects of the existing system in either permitting or encouraging price fixing or providing unfair competitive advantage for producers or disadvantages for consumers not based on natural causes.

"The trade commission does not appear to have studied either jointly with NRA or otherwise the questions referred to by the President, and the report made by the commission to the President, if judged from its press release, is not a report on a study of the basing system but is an attack on codes and the codification of industry under NRA with particular reference to the steel code.

"The trade commission seizes upon instruction to study the basing point system as a pretext to launching such an attack. Moreover, it is a biased, inaccurate and misleading statement regarding the basing point method of quoting prices and the operation of the steel code as an example of codifications of industries under NRA.

"A glaring instance of the misleading statements contained in the report is a reference to alleged excessive price increases on certain classes of products sold under navy specifications to the navy. It is impossible to make any comparison between the extras applicable to certain classes of products prior to and subsequent to September 1, 1934, on which the commission assumed to base its calculation of such increases in extras because a change made by the navy in its specifications for such classes of products had the effect of creating entirely new products involving much more exacting conditions in manufacture than had previously existed. No better example of a lack of study or deliberate unfairness could be found.

"Charges that directors of the Institute as the code authority under the steel code withheld from the commission any evidence pertinent to a study by the commission directed by the President are wholly without foundation.

"The board of directors as administrative body for steel code stands ready at any time to make available to any impartial tribunal all of its records and all pertinent information available to it relating to the basing method and to help such a tribunal in every way within its power so that all pertinent facts shall be had, and correct and proper conclusions be reached.

"The charge that the basing point method of quoting prices is only a device for price fixing is entirely unwarranted."

Since NRA and the steel code authority have enjoyed an amicable relationship, on the whole, and in Washington NRA is considered friendly to the steel industry, the recommendation for group mill bases is received with great interest. The presumption is that any extension of basing points would be along the line proposed by NRA.

Certainly, either group mill basing districts or a complete abolition of the basing point system would create considerable chaos not only among producers of steel but even more so among consumers, many of whose plants have been located to take advantage of the operation of the basing point system.

NRA Case for Groups

Recognizing the merit of some arguments against present multiple basing points, the NRA proposal is to group producing capacity in a given product within the radius of 50 miles into what it calls a group mill base. Its arguments for this system include:

A. An approximation to a mill base system while avoiding the impracticabilities of the latter. Freight charged to customers would be approximately actual freight, rather than arbitrary freight from distant competing points.

B. Compact group mill base districts, coinciding with all districts producing even relatively small amounts of primary iron or steel.

C. All pig iron capacity would be within 50 miles of a group mill base.

D. Only 1¾ per cent of rolling mill capacity would be more than 50 miles from a group mill base.

E. The rolling capacity referred to in D above would, in general, consist of isolated, small rolling mills without steelmaking capacity, whose costs would naturally reflect the cost of transporting the steel to their works and consequently would, in general, be based upon the steelmaking group mill bases from which they purchased semifinished steel.

F. Plants making steel for castings or products not covered by the steel code, but able to make ingots incidentally, are properly disregarded by the requirement in the group mill base definition for rolling or other facilities for producing semifinished products.

G. Plants representing over 98 per cent of the capacity of the industry as covered by the code would file base prices at a group mill base in their immediate vicinities, and thus be able to take any advantage of their

Division of Voting Strength On Steel Code Authority

	Number of votes	Per cent of total votes
United States Steel Corp.	335	25.7
Bethlehem Steel Co.	122	9.1
Republic Steel Corp.	86	6.4
National Steel Corp.	81	6.0
Jones & Laughlin Steel Corp.	49	3.7
Wheeling Steel Corp.	48	3.6
Youngstown Sheet & Tube Co.	46	3.4
American Rolling Mill Co.,	45	3.4
Inland Steel Co.	27	2.0
Crucible Steel Co. of America	23	1.7
Corrigan, McKinney Steel Co.	21	1.6
McKeesport Tin Plate Co.	19	1.4
Spang, Chalfant & Co.	16	1.24
Allegheny Steel Co.	15	1.1
Pittsburgh Steel Co.	15	1.1
Colorado Fuel & Iron Co.	12	0.9
Otis Steel Co.	12	0.9
Sharon Steel Hoop Co.	12	0.9
Continental Steel Corp.	11	0.9
John A. Roeblings' Sons Inc.	10	0.8

The above includes all companies having ten or more votes; this group controls 1005 votes or 75 per cent of the total. Also, two companies have 8 votes each; one, 7; three, 6; six, 5; twelve, 4; nine, 3; eighteen, 2; and 145 companies 1 each, making a grand total of 1332 votes, which are based on sales.

economic situation, as they might choose and would not have to maintain a price on a distant group mill base.

H. As "plant-towns" containing rolling facilities increase steelmaking capacities from negligible amounts to amounts greater than 20,000 tons annually, it would automatically be required that a group mill base within 50 miles be established, if none already existed. Conversely the group mill bases would automatically be abandoned in cases where sufficient decrease in capacities took place. This would provide a flexibility for the designation of group mill bases, insuring sufficency of these without the necessity for any amendment to the language of the code.

I. Elimination of basing points at non-producing points, such as certain Gulf and Pacific ports, which are open to abuse and inequality.

A complete study has been made by NRA of the possibilities of new basing points as a result of its 50-mile zone bases. In pig iron, for example, there now are 21 basing points and only 9 new ones would be created. But in merchant bars there are now only 10 basing points, whereas 28 new ones would be created. In both cases, these include Pacific coast points.

Some typical examples of how the number of basing points would be increased by the group plan of NRA follow:

Pig Iron

Present bases: Duluth; Chicago; Granite City, Ill.; Provo, Utah; Birmingham, Ala.; Neville Island, Pa. (Pittsburgh); Detroit; Toledo, O.; Cleveland; Hamilton, O.; Jackson, O.; Youngstown, O.; Erie, Pa.; Sharpsville, Pa.; Buffalo; Steelton, Pa.; Birdsboro, Pa.; Bethlehem, Pa.; Swedeland, Pa.; Sparrows Point, Md.; Everett, Mass. (Boston).

Possible new bases: Dubois, Pa.; Johnstown, Pa.; Roanoke, Va.; Columbus, O.; Mayville, Wis.; Pueblo, Colo.; Rockwood, Tenn.; Port Henry, N. Y.; Troy, N. Y.

Merchant and Concrete Bars

Present bases: Moline, Ill.; Chicago; Duluth; Los Angeles; Seattle; Gary, Ind.; Birmingham, Ala.; Cleveland; Buffalo; Pittsburgh.

Possible new bases: St. Louis; Ft. Wayne, Ind; Terre Haute, Ind.; Sand Springs, Okla.; Ft. Worth, Tex.; Minnequa, Colo.; Sacramento, Calif.; Knnsas City, Mo.; Alabama City, Ala.; Atlanta, Ga.; Marion, O.; Youngstown, O.; Huntington, W. Va.; Knoxville, Tenn.; Richmond, Va.; Detroit; Syracuse, N. Y.; Cohoes, N. Y.; Sparrows Point, Md.; Johnstown, Pa.; Bethlehem, Pa.; Lebanon, Pa.; Burnham, Pa.; Williamsport, Pa.; Philadelphia; Harrison, N. J.; South Portland, Me.; Worcester, Mass.

Sheet Bars

Present bases: Chicago; Cleveland; Pittsburgh; Buffalo; Youngstown, O.; Canton, O.; Sparrows Point, Md.

Possible new bases: Mansfield, O.; Portsmouth, O.; Newport, Ky.; Parkersburg, W. Va.; Fairfield, Ala.; Granite City, Ill.; Kansas City, Mo.; Pittsburgh, Calif.; Torrence, Calif.

Structural Shapes

Present bases: Chicago; Buffalo; Pittsburgh; Birmingham, Ala.; Bethlehem, Pa.; Seattle; San Francisco; San Pedro, Calif.; Houston, Tex.

Possible new bases: St. Louis; Minnequa, Colo.

Plates

Present bases: Chicago; Gary, Ind.; Pittsburgh; Coatesville, Pa.; Sparrows Point, Md.; Birmingham, Ala.; Seattle.

Possible new bases: Cleveland; Youngstown, O.; Lackawanna, N. Y. (Buffalo); Johnstown, Pa.; Harrisburg, Pa.; Alabama City, Ala.; Granite City, Ill.; New Castle, Ind.; Pueblo, Colo.

Sheets

Present bases: Pittsburgh; Gary, Ind.; Birmingham, Ala.; San Francisco; San Pedro, Calif.

Possible new bases: Detroit; Buffalo; Ashtabula, O.; Cleveland; Mansfield, O.; Youngstown, O.; Dover,

A Breakdown of Steel Capacity

Capacity Statistics in Tons as of October, 1934, supplied by the American

Location of producer	Blooms, billets and slabs [1]		Sheet bars	Skelp	Merchants [2] and concrete [2] reinforcing bars	Structural shapes	Plates	Sheets	Strip steel		Tin plate, sheet terne plate, and tin mill black plate		Pipe—standard and line pipe and oil country tubular products	Wire			
	Blooms and slabs	Billets							Hot rolled	Cold rolled	Black plate (tons)	Tin plate and terne plate (base boxes)		Wire rods	Wire drawn	Barbed wire and wire fencing	Nails (kegs)
New Jersey:																	
Harrison	*83,000				*30,000												
Jersey City					*12,000												
Newark										*7,000							
Rockaway					*10,000												
Roebling	*150,000																
Trenton										*33,000				*110,000	*100,000		
Delaware: Claymont							*228,000	*24,000							*42,000		
Maryland:																	
Baltimore								*89,000									
Cumberland					*72,000												
Sparrows Point	*2,815,000		*800,000	*230,000	*85,000		*400,000	*174,000			*20,000	*720,000					
Eastern Pennsylvania:											*204,000	*4,500,000	*175,000	*125,000	*72,000	*9,800	*677,000
Allentown																	
Berwick					*72,000									*105,000	*103,000	*59,000	*871,000
Bethlehem	*1,570,000				*150,000	*1,175,000											
Burnham					*30,000												
Coatesville	*300,000			(3)			*380,000										
Columbia					*20,000								*24,000				
Conshohocken								*108,000									
Chester													*70,000				
Danville					*51,100												
Harrisburg	*72,000			*20,000			*222,200										
Ivy Rock	*370,000						*130,000										
Lebanon					*230,000												
Milton					*20,000												
Pencoyd	*209,000				*32,000	*190,000		*15,000									
Philadelphia	*21,500				*37,000												
Phoenixville	*300,000				*14,000	*160,000											
Pine Forge							*12,000										
Pottstown							*12,000										
Reading				*142,000						*8,200							
Steelton	*800,000												*115,400			*3,600	
Williamsport					*24,000												
Western Pennsylvania:																	
Aliquippa	*910,800		*174,000	*297,000	*50,000	*90,000					*168,000	*3,225,000	*636,000	*294,000	*171,000	*27,000	*806,000
Allenport													*140,000				
Ambridge													*750,000				
Apollo								*143,000									
Beaver Falls					*72,000								*71,400				
Bessemer						*20,000											
Brackenridge	*309,000		*220,000				*75,600	*214,200					*29,000				
Braddock															*84,800		
Bridgeville	*26,000				*13,000			*12,000		*5,000							
Butler								*310,300					*34,000				
Canonsburg								*38,000									
Carnegie					*120,000				*107,000	*30,000	*104,000	*2,802,000					
Clairton	*620,000				*245,500	*270,000											
Colona	*36,000																
Donora	*523,000													*310,000	*192,000	*49,000	*1,288,000
Duquesne	*1,054,800		*100,000		*930,100												
Ellwood City													*210,000				*134,000
Erie										*25,000							
Farrell	*53,000		*403,000	*57,000			*132,000	*77,200			*121,300	*2,216,000		*150,000	*89,300	*60,000	*1,176,000
Franklin					*45,000									*30,000	*10,000		
Glassport	*30,000													*165,000	*80,300	*19,400	*402,000
Johnstown	*283,000				*550,000	*6,000	*275,000						*509,000				
McKeesport	*667,000			*567,800				*104,000									
McKees Rocks					*49,000								*58,500				
Midland	*535,000				*300,000						*102,000	*2,206,000	*110,000	*390,000	*321,000	*150,200	*2,525,000
Monaca																	
Monessen																	
Munhall	*2,432,200					*674,800	*995,200	*12,000	*60,000								
North Braddock	*750,000		*462,000							*14,500	*265,600	*5,253,000					
New Castle			*425,300								(3)	(3)					
Pittsburgh	*1,806,000	(3)	(3)	*120,000	*1,061,500	*180,000	*241,850	*12,000	*18,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Portvue											*180,000	*3,800,000					
Rankin														*115,000	*107,000	*62,000	*1,080,000
Scottdale								*89,000									
Sharon									*426,000	*45,000							
Vandergrift			*272,000					*188,900									
Washington																	
West Leechburg									*214,000	*54,000	*26,000	*502,000					
Wheatland													*84,000				
Wilson Station										*27,000							
West Virginia:																	
Beech Bottom								*72,000									
Benwood	*196,000			*120,000									*189,000				
Clarksburg											*55,000	*1,321,000					
Follansbee	*94,500		*79,000					*40,000			*33,900	*1,065,000					
Huntington					*47,000												
Morgantown											*39,800	*844,000					
Parkersburg			*20,000					*60,000									
Wheeling											*54,000						
Weirton	*1,000,000		*110,000		*29,800	*187,000		*396,000	*350,000	*65,000	*115,000	*3,472,000					
Ohio:																	
Ashtabula								*40,000									
Bedford															*8,000		
Cambridge								*62,000									
Cambridge											*34,000						
Canton	*500,000		*380,000		*524,000			*326,300			*32,000	*511,000	*130,000				
Cleveland	*1,942,000	(3)	*534,000		*525,600			*120,000	*340,000	*379,000	*194,000		*60,000	*24,000			
Dover								*113,400		*54,000				*459,000	*326,000	*53,500	*1,358,000
Elyria					*72,700										*10,800		
Fostoria															*28,700		
Ironton															*44,600		
Lorain	*1,242,000			*329,000													
Lowellville	*262,000		*100,000										*670,000				
McDonald				*228,500	*466,000												
Mansfield			*270,000					*90,000									
Marietta											*55,000	*815,000					
Marion					*39,000												
Martins Ferry								*42,000			*92,000	*1,977,000					
Massillon	*380,000				*300,000			*101,800	*100,000								
Middletown	*153,000							*316,000									
Mingo Junction	*70,000		*416,000	*30,000													
New Philadelphia								*94,800									
Newton Falls								*130,000			*10,000						
Niles								*228,000									
Portsmouth	*220,000		*140,000					*210,000						*120,000	*107,000	*72,000	*1,210,000
Shelby													*54,000				
Steubenville	*920,000		*440,000	*132,000				*240,000			*55,000	*1,859,000	*72,000				
Struthers (or Campbell)					*201,000			*107,000									
Toronto			*100,000					*72,000					*708,000	*110,000	*98,000		*1,120,000
Warren	*330,000		*300,000					*183,000	*335,000	*164,000	*139,000	*2,000,000					
Wellsville								*52,800									
Wooster													*15,000				
Yorkville											*144,000	*3,225,000					
Youngstown	*1,815,400	(3)	*1,405,600	*783,000	*813,200		*431,400	*262,000	*80,000				*921,000	(3)			
Zanesville								*67,200									

O.; Kokomo, Ind.; New Castle, Ind.; Newport, Ky.; Ashland, Ky.; Parkersburg, W. Va.; Baltimore; Conshohocken, Pa.; Alabama City, Ala.; Granite City, Ill.; Kansas City, Mo.

Hot Rolled Strip

Present bases: Chicago; Pittsburgh; Birmingham, Ala.

Possible new bases: Detroit; Alton, Ill.; Atlanta, Ga.; Fort Wayne, Ind.; Cleveland; Youngstown, O.; Worcester, Mass.; Bridgeport, Conn.; Pueblo, Colo.

Cold-Rolled Strip

Present bases: Cleveland; Pittsburgh; Worcester, Mass.

Possible new bases: Riverdale, Ill. (Chicago); Reading, Pa.; Newark, N. J.; Dover, O.; Detroit; Erie, Pa.; Rome, N. Y.; Bridgeport, Conn.; Sharon, Pa.

Tin and Terne Plate and Tin Mill Black

Present bases: Gary, Ind.; Pittsburgh.

Possible new bases: St. Louis; Elwood, Ind.; Warren, O.; Marietta, O.; Clarksburg, W. Va.; Baltimore; Cumberland, Md.

Steel Pipe

Present bases: Pittsburgh; Lorain, O.; Gary, Ind.

Possible new bases: Pueblo, Colo.; Milwaukee; Alton, Ill.; Detroit; Youngstown, O.; Reading, Pa.; Cohoes, N. Y.; Sparrows Point, Md.

Wire Products

Present bases: Cleveland; Pittsburgh; Chicago; Birmingham, Ala.; Anderson, Ind.; San Francisco.

Possible new bases: Minnequa, Colo.; Kansas City, Mo.; Alabama City, Ala.; Atlanta, Ga.; Peoria, Ill.; Dekalb, Ill.; Crawfordsville, Ind.; Portsmouth, O.; Youngstown, O.; Buffalo; Cortland, N. Y.; Allentown, Pa.; Worcester, Mass.; Sparrows Point, Md.

by Leading Products and Cities

Iron and Steel Institute to NRA; Announced by Federal Trade Commission

Location of producer	Blooms, billets, and slabs [1]		Sheet bars	Skelp	Merchant [2] and concrete [3] reinforcing bars	Structural shapes	Plates	Sheets	Strip steel		Tin plate, sheet terne plate, and tin mill black plate		Pipe—standard line pipe and oil country tubular products	Wire			
	Blooms and slabs	Billets							Hot rolled	Cold rolled	Black plate (tons)	Tin plate and terne plate (base boxes)		Wire rods	Wire drawn	Barbed wire and wire fencing	Nails (kegs)
Maine: South Portland					*8,000												
Massachusetts:																	
Boston										*12,000							
Medford					*18,000										*7,800		
Millbury																	
Worcester	*159,000				*8,000				*12,000	*31,000				*160,500	*199,000		*179,000
Rhode Island:																	
Phillipsdale	*31,600								*24,000					*25,000	*15,000		
Pawtucket										*10,800							
Connecticut:																	
Branford															*22,000		
Bridgeport	*100,000								*125,000	*24,000							
New Britain									*35,000	*40,000					*23,000		
New Haven															*8,000		
Shelton																	
Wallingford										*20,000							
New York:																	
Buffalo	[4] 600,000	(4)	(5)	(4)	[4] 506,400	(4)								*120,000	*164,000	*4,000	*45,000
Cohoes				*2,000	*80,000								*20,000				
Cortland	*35,000													*35,000	*32,000		*202,000
Dunkirk	*15,000																
Lackawanna	*1,900,000		*350,000		*400,000	*650,000	*48,000	*150,000									
New York										*21,000							
North Tonawanda														*20,000	*16,000		
Rome					*11,125					*9,000							
Syracuse	*30,000				*10,000											*10,000	
Tonawanda					*71,000												
Troy					*18,000												
Watervliet	*18,000																
Indiana:																	
Anderson														[4] 105,000	[4] 67,000	[4] 27,000	[4] 739,000
Crawfordsville															*15,000	*19,200	*88,000
East Chicago					*53,600								*320,000		*45,000		
Elwood											*81,200	*1,772,000					
Fort Wayne					*20,000				*11,000								
Gary	*2,472,000	(5)	*300,000	*345,900	[4] 976,500	*168,500	*480,000	*500,100	*936,000		[4] 276,500	46,127,600	[4] 571,800				
Indiana Harbor	*2,444,800		*562,000	*450,000	*520,000	*100,000	*200,000	*400,000	*40,000	*8,000	*210,000	*5,378,000					
Indianapolis								*45,000									
Hammond					*100,000												
Kokomo	*150,000		*75,000					*51,500						*120,000	*118,000	*60,000	*864,000
New Castle							*25,000	*25,000									
Terre Haute					*18,000												
Illinois:																	
Alton	*200,000			*15,000	*30,000				*130,000				*37,000		*15,000		
Chicago	(5)	(5)	(5)	(5)	[4] 32,000	(5)	(5)		[4] 8,000				*60,500	[4] 55,500	[4] 73,500	(5)	*358,000
Chicago Heights					*105,000											*57,300	
DeKalb															*89,300	*67,000	*946,000
Evanston													*60,000				
Granite City			*176,540				*98,000	*88,000			*88,000	*1,490,000					
Harvey					*71,400												
Joliet	*600,000				*35,200									*282,000	*192,000	*160,000	*1,243,000
Madison					*120,000												
Moline					[4] 54,000									*150,000	*120,000	*83,500	*860,000
Peoria	*170,000																
Riverdale									*450,000	*36,000					*110,000	*76,000	*774,000
Sterling																	
South Chicago	*3,171,500		*300,000	*65,000	*801,400	*871,900	*1,216,000	*200,000	*110,000					*80,000			
Waukegan														*225,000	*162,000	*23,000	
Michigan:																	
Dearborn					*480,000					*16,000							
Detroit	*600,000				*18,000				*420,000	*78,400			*25,800				
Ecorse					*536,000			*214,040									
Jackson																*4,100	
Monroe								*200,000		*10,000							
Wisconsin:																	
Kenosha					*40,000												
Milwaukee					*237,900								*1,004,000				
Minnesota: Duluth	*444,800	(5)			[3] 78,500									*100,000	*87,000	*73,000	*616,000
Missouri:																	
Kansas City	*160,000		*30,000		*292,500			*87,600						*26,000	*32,000	*40,000	*672,000
St. Louis	*15,000				*215,000	*180,000											
Colorado: Minnequa	*810,000				*819,600	*287,000	*108,000		*17,000				*18,000	*75,000	*107,000	*80,600	*1,210,000
Oklahoma: Sand Springs	*50,000				*40,000												
Texas:																	
Fort Worth					*20,000												
Galveston														(5)	*7,000	*5,000	*448,000
Virginia: Richmond					*20,000												
Georgia: Atlanta	*95,000				*67,000				*36,000					*18,000	*9,000	*20,000	*358,000
Alabama:																	
Alabama City	*250,000				*180,000		*108,000	*102,000						*90,000	*160,700	*94,000	*2,258,000
Anniston					*54,000												
Bessemer					*74,200	*5,000											
Birmingham	(5)	(5)			(5)	(5)	(5)	(5)	(5)					(5)	(5)	(5)	(5)
Ensley	*691,600																
Fairfield	*509,120		*120,580		*156,100	*79,000	*238,300	*159,700	*8,500					*110,000	*91,000	*100,800	*1,142,000
Woodlawn					*21,000				*10,000								
Gulfports					(5 7)	(5 7)	(5 7)								(5 7)	(5 7)	(5 7)
Kentucky:																	
Ashland								*377,000									
Newport	*200,000		*100,000					*182,000									
Tennessee: Knoxville					*71,000												
Washington: Seattle					[4] 76,000	*52,500	[4] 19,500										
California:																	
Emeryville					*58,000												
Huntington Park	*36,000				*58,000												
Pittsburgh	*83,200		*90,000		*37,500			*30,700			*36,000	*1,187,000		*60,000	*35,400	*6,800	*435,000
Sacramento					*20,000												
South San Francisco					*89,500	*27,100								(5)			
Torrence	*91,000		*44,000		*49,900	*36,000		*48,000									
Pacific coast ports					(5 7)	(5 7)	(5 7)	(5 7)			(5 7)	(5 7)			(5 7)	(5 7)	(5 7)
Total for United States	47,918,500		9,299,920	4,102,200	14,367,925	5,380,800	6,187,850	7,938,800	4,891,500	1,042,400	2,691,800	58,067,600	3,558,400	4,304,000	4,000,800	1,516,700	26,134,000

* Not a basing point for product indicated in caption.
[1] Tonnage indivisible. Total indicated under subheading of blooms and slabs.
[2] Basing point for merchant bars.
[3] Basing point for concrete reinforcing bars.
[4] Basing point for specific form indicated in caption.
[5] Basing point for form indicated in caption but not shown by American Iron & Steel Institute as having capacity to produce the form.
[6] Basing point for rail-steel bars only.
[7] Such specific Gulf and/or Pacific coast ports as are also producing points are elsewhere specifically indicated.

FTC Points to Four Ways

In its report, the trade commission said there were four theoretically possible recommendations:

(*a*) That the multiple basing-point system, while it is a means for preventing price competition, is justified as a permanent policy by the evils of competition; or

(*b*) That in view of the chaotic business conditions now prevailing, the basing-point system be permitted to continue until recovery has been achieved or at least further advanced; or

(*c*) That the code be so amended as to prohibit the multiple basing-point system; or

(*d*) That the code be so amended as to eliminate federal sanction of the multiple basing-point system and relegate the legality of the practice to judicial determination.

The recommendation which the commission urges is put in this manner:

Pursuant to the executive order and in harmony with our views as set forth in this report, we respectfully recommend that the amended code be changed to eliminate provisions falling within the following classifications:

(*a*) Provisions giving express sanction to the multiple basing-point system;

(*b*) Provisions in aid of price fixing; and

(*c*) Provisions relating to regulation of production and new capacity.

Making out a case for the present basing point system, following a canvass of important steel makers and users, the Institute states:

"It is not easy to predict all the effects which would follow from discontinuing the basing point method of quoting prices, but among the effects there would be in some places restriction of markets, lessened production and sharp decreases in the demand for labor, possibly to the ultimate elimination of some activities on which many workers depend. In other places, there would be monopoly of important markets, stimulated production, and accompanying sharp increases in the demand for labor.

"One of the principal reasons, if not the chief reason, why the basing point

(*Continued on Page 90*)

Labor

NATIONAL steel labor relations board last week exonerated Wheeling Steel Corp. from violating section 7a at its Portsmouth, O., plant, and found it not guilty of discriminating against members of the Amalgamated association. But, "in the interest of industrial peace and harmony" it ordered an election and demanded payrolls. Such orders against other steel companies in the past have produced injunctions rather than payrolls.

LABOR'S DOLLAR BUYS LESS

Cost of living of wage earners increased 1 point in February, according to the National Industrial Conference board. With 1923 equaling 100, the February index of the purchasing value of the dollar was 121.4, compared with 122.5 in January.

NRA

APPEARING Friday before NRA in connection with mill quantity differentials on shapes and plates, V. G. Iden, New York, acting secretary of the American Institute of Steel Construction, objected to these differentials because they would have increased costs of structural fabricators up to $8 per ton. The differentials have been suspended until the third quarter of 1935. Extras for size, shape and quality published in September, 1934, were twice as numerous as the extras of the year preceding, he claimed.

W. H. Pouch, president, Concrete Steel Co. and representing reinforcing bar interests, protested that the jobbers' agreement contained in the steel code is operating in such manner as to "dictate to our members how they shall conduct their business."

The reinforcing materials fabricating industry, Mr. Pouch stated, does warehousing and is a semi-professional business by reason of the engineering service it renders.

The jobbers' agreement, he declared, is the most serious of several distribution provisions which overlap in codes for this industry and the steel business inasmuch as "our members are given no voice in formulating the agreement which is working an injustice for us."

NRA LAST WEEK:

Set March 26 for a hearing on amendments to the metal windows industry code, and March 29 for a hearing on amendments to the complete wire and iron fence industry code.

Fixed March 28 as the final date for receiving objections to proposed amendments to the chain code, permitting manufacturers of tire chains to adopt a consignment plan.

WANTS NRA SCUTTLED

Junk NRA except for its child labor, minimum wages and maximum hours provision, Sen. William E. Borah, Republican of Idaho, urged the senate finance committee last week in its investigation of NRA in consideration of its extension (see page 30).

Structural Code

FOLLOWING suggestions made by NRA, structural steel fabricators have prepared an entirely new code. The code originally promulgated by General Johnson last July has been stayed as a result of the insistence of fabricators they will not accept any code in which control over the erection of steel is placed under the construction code.

Home Use of Steel, with Refrigerator, Half Ton

STEEL is a constant servant in the home from the time breakfast is cooked on an iron and steel stove in steel pan until the steel alarm clock is set at night, the American Iron and Steel institute points out.

Housewives own and use an average of 600 pounds of steel in their homes, and where there is mechanical refrigeration this average jumps to almost 1000 pounds.

The total weight of iron and steel now in service in house furnishings, housekeeping equipment and feminine possessions is estimated at 15,000,000,000 pounds, exclusive of furnaces, automobiles and plumbing fixtures.

Typical of representation of iron and steel in the home which has mechanical refrigeration is the following:

	Pounds of Iron, Steel
1 kitchen stove	250
4 spring mattresses	80
2 umbrellas	1
1 mechanical refrigerator	190
1 steel bed	40
1 steel lamp	10
Washing machine	150
Springs for 4 beds	109
3 pairs of scissors	1
Kitchen pans and utensils	10
1 bridge table	15
1 electric iron	6
Davenport springs	15
Springs for 4 upholstered chairs	20
Kitchen and table knives	2
Picture wire, ash trays, book ends, steel wool	2
Nail files, manicure sets, hairpins, needles, pins, compact	6 oz.
Bird cage and stand	25
Garbage pail	5½
Waste basket	2
Total steel	934

Steel in the News

HOW the Mellon family backed H. H. McClintic and C. D. Marshall in formation of the McClintic-Marshall Construction Co., later the McClintic-Marshall Corp., in 1900, was told last week during the income tax hearing at Pittsburgh, involving Andrew W. Mellon, former secretary of the treasury.

Mr. Mellon and his brother, the late R. B. Mellon, each put in $75,000 and took back 60 per cent of the stock. The two engineers put in $50,000 each and managed the business. For his share, the Bethlehem Steel Corp. is said to have paid Andrew Mellon in 1931, when Bethlehem absorbed McClintic-Marshall, a total of $20,049,000.

NEW WAY OF COVERING SCRAP

A Chicago policeman, walking his beat last week, discovered the theft of 36 manhole covers. At 35 pounds each their weight was 910 pounds, and with the market for No. 1 machinery cast at $9.50, their value about $3.85.

STEEL GOES MUSICAL

Noises and sounds emanating from the American Rolling Mill Co. plant at Middletown, O,. are recorded for the ages in an opus-Rhapsody in Steel—written by Ferde Grofe, modernistic composer, and played for the first time last week by an orchestral band of 100 pieces at the American Bandmasters' association convention at Cincinnati.

Woodwinds and stringed bases in four-four time, softly at first but assuming a sharper note when joined by the lower brasses, announce man's discovery of ore. Then the scene shifts to the mills, where the trumpets and percussion section simulate the hissing of molten metal, the clanging of hammers, the screeching of whistles, even the sweat of the workmen. A tank of compressed air interprets the hiss of hot metal in the ladle.

Grofe explained he got the idea from a visit to Middletown several years ago. Critics appraised his work as probably coming as close as music can to describing what a steel mill is like.

Meetings

ELECTRICAL Metal Makers Guild has scheduled its annual meeting April 12-13 at Hotel Pritchard, Huntington, W. Va. Subjects for technical sessions include: Absorption of hydrogen; arc vs. induction furnaces in stainless steel; stainless steel melting; aluminum in tool steels—stainless iron; slags,

manganese steel; a paper on either nickel or chrome-nickel bearing metals. Joseph A. Scott, 166 Tappan avenue, Belleville, N. J., is secretary.

FORMING FOUNDRY GROUP

Harry W. Dietert, chief metallurgist, U. S. Radiator Co., Detroit, will address a meeting of foundrymen from northeastern Ohio, Monday evening, March 25, at the Hotel Hollenden, Cleveland, on "Molding Sand." The meeting is being held under the auspices of the northeastern chapter of the American Foundrymen's association, now being formed. Donald J. Reese, Whiting Corp., Harvey, Ill., and president of the Chicago chapter, will give the coffee talk.

JAPAN PLANS EXHIBIT

A metal industry exhibition will be held May 10-31 in the Commercial museum, Osaka, Japan, under auspices of AGNE, publisher of the *Journal of Metals*, and NIKKAN KOGYO SHINBUN-SHA, the *Daily Industrial News*. All nations are invited to exhibit castings, roll products, forgings, equipment for heat treating, plating, and welding, and tools.

ELECTROPLATERS TO CONVENE

American Electroplaters society has scheduled its annual convention at Bridgeport, Conn., June 10-13, at the Stratfield hotel. Concurrently, an exhibition will be held, showing improved materials, equipment and apparatus used in the metal finishing field. Eugene Phillips, 67 Roanoke avenue, Fairfield, Conn., is chairman of the publicity committee.

STEEL AND ART MEET

Leaders of the steel and allied industries are active on a committee of the National Alliance of Art and Industry which will stage an industrial art exhibition, April 15 to May 15, at the Rockefeller Center forum, New York. These men are:

T. M. Girdler, president, Republic Steel Corp., Youngstown, O.,; Elon Huntington Hooker, president, Hooker Electrochemical Co., New York; Robert C. Stanley, president, International Nickel Co., New York; and Edward G. Budd, president, Edward G. Budd Mfg. Co., Philadelphia; Charles J. Hardy, president, American Car & Foundry Co., New York; and William P. Priestley, vice president, Union Carbide & Carbon Corp., New York.

¶British Institute of Metals has scheduled three general meetings for the coming year—in March, May and September, 1935. At the May meeting, Prof. W. R. Bragg will deliver the annual lecture. The annual autumn meeting next year will be held at Newcastle-on-Tyne. G. Shaw Scott, 36 Victoria street, Westminster, London, S. W. 1, as secretary.

Production

STEEL production relinquished its 2 point gain last week, falling back to 48 per cent, due partly to a slackening in steel mill operations. In some districts there appears to be a letdown in demand for finished products. Declines in the Cleveland, Chicago, eastern Pennsylvania, New England and Detroit districts more than offset the 3-point rise at Youngstown. Schedules this week indicate a further decline. Details:

Buffalo—Held unchanged at 38 per cent, with 14 out of 38 open hearths in production.

Youngstown—Gained 3 points to 58 per cent last week, and tentative schedules this week are expected to lift the rate to 60 per cent. The upturn in pipe orders accounts largely for this gain.

Pittsburgh—Held at 38 per cent last week. For this week, schedules likely will be revised downward and may fall to the 35 per cent mark, due to suspension of rail-rolling operations, plus a general decline in steel buying for immediate shipment. American Steel & Wire Co. blew in one of its two Donora, Pa., blast furnaces, the first blast furnace operation there since September, 1934, and making a total of 24 out of 60 operating. Other schedules are Carnegie 9 of 32, Jones & Laughlin 6 of 11, National Tube 2 of 4, Pittsburgh Crucible Steel and Pittsburgh Steel each 1 of 2, and Bethlehem 4 of 7.

New England—Off 8 points to 53 per cent, with a further decline expected this week to well under 50 per cent, according to schedules.

Central eastern seaboard—Fractionally lower at around 28 per cent, with likelihood that there will be a further reduction before another upward trend sets in. Over the past week there appeared to be a letdown in demand for practically all finished products. A notable exception has been tin plate, for which shipments are being well maintained.

Chicago—Slipped 4 points to 51 per cent, lowest level since the attainment of the year's peak early in February. Blast furnace operations are unchanged at 14 active steelworks stacks of 36. One interest plans the addition of another stack in the near future. Two merchant furnaces continue in blast.

Cleveland-Lorain—Down 2 points to 72 per cent, National Tube Co., Lorain, taking off one open hearth and operating ten; Corrigan, McKinney Steel Co., ten, and Otis Steel Co., eight. A further decline of about 2 points may develop this week.

Birmingham, Ala.—Steady at 55½ per cent. Unless affected by coal mine strikes, this rate, based on ingot production, is scheduled to continue until June at least.

Wheeling—Unchanged at 92 per cent with 34 out of 37 open-hearth furnaces continuing active.

Detroit—Down 6 points to 88 per cent, owing to each producer taking off an open hearth for repairs.

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended Mar. 16	Change	Same week 1934	Same week 1933
Pittsburgh	38	None	35	13½
Chicago	51	— 4	48½	12
Eastern Pa.	28	— 0½	32½	11½
Youngstown	58	+ 3	56	15
Wheeling	92	None	70	†
Cleveland	72	— 2	82	19
Buffalo	38	None	52	11
Birmingham	55½	None	52	15
New England	53	— 8	63	†
Detroit	88	— 6	93	†
	48	— 2	50	15

†Not reported in 1933.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)

(Tons)

	1935	1934	1933	1932
Jan.	534,055	331,777	285,138	426,271
Feb.	583,137	385,500	275,929	413,001
March		588,209	256,793	388,579
April		643,009	335,321	395,091
May		745,063	455,302	338,202
June		985,337	603,937	324,746
July		369,938	701,322	272,448
Aug.		378,023	668,155	291,688
Sept.		370,306	575,161	316,019
Oct.		343,962	572,897	310,007
Nov.		366,119	430,358	275,594
Dec.		418,630	600,639	227,576
Yrl. adj.			44,283	5,160
Total		5,925,873	5,805,235	3,974,062

CORP. SHIPMENTS MOUNT

Shipments of finished steel products by the United States Steel Corp. in February were 583,137 tons, a gain of 49,082 tons over those of January. Compared with February, 1934, the gain is 197,637 tons. This is the fifth consecutive month of increase in shipments, and the February figure is the best since June, 1934.

WINS OVER SQUATTERS

Indiana supreme court has closed a 30-year battle of several squatters who have claimed an 88-acre, mile long tract of Lake Michigan frontage at Gary, Ind. The court's decision was a victory for the Gary Land Co., subsidiary of the United States Steel Corp.

Financial

HAVING submitted an annual report to stockholders, officers of the Ludlum Steel Co., Watervliet, N. Y., devoted a recent issue of *The Ludlum News* to a report to its employes. The object was "to take the mystery out of business."

A series of questions and answers gave information on how the company is doing (better); whether it is showing a profit (yes); if sales amounted to $4,709,000 and profit was only $442,348, where did the rest of the money go (wages, materials, fuel, maintenance, administration, selling); how is the cost of steel divided up (39 per cent for material and supplies, 29.2 for payroll, 6.8 for power and fuel, 3.5 for depreciation); are Ludlum stockholders satisfied with their investment (they have shown great patience and cooperation); how do things look for 1935 (prosperity will return slowly and steadily).

J. & L. MAY REFUND

Coincident with plans of Jones & Laughlin Steel Corp., Pittsburgh, to expend up to $15,000,000 on new plant capacity, the report was current in financial circles last week that the company would undertake corporate refunding plans shortly. Jones & Laughlin Steel Corp. has outstanding $7,000,000 of 5 per cent bonds, due in 1939. It is believed that the plan is being considered to refund the outstanding bonds at a premium and consolidate the issue with a new and larger bond issue to cover new expenditures.

NATIONAL EMPLOYS 16,590

National Steel Corp., Pittsburgh, in its pamphlet report for 1934 shows net earnings of $6,050,722, or $2.80 a share. Other data for 1934: Charges for depreciation and depletion, $3,653,743; additions to plant and property, $1,747,319; wages paid, $22,603,691; number of employes Dec. 31, 16,590; working capital Dec. 31, $33,932,493; dividends paid, $2,155,777.

HEAR WICKWIRE SPENCER REORGANIZATION PLAN APRIL 8

Wickwire Spencer Steel Co., New York, plans reorganizing and will submit a plan to creditors and stockholders at a hearing in federal court at Buffalo, April 8. The company has been in receivership for seven years, but this plan is reported to be the first actually submitted to interested parties for confirmation.

Plan provides for issuing bonds up to $2,000,000 to provide new working capital. Present holders of first mortgage bonds, note holders and other creditors are to receive ten shares of new preferred stock of $50 par value for each $1000 indebtedness, plus four shares of no par common. Stockholders are to receive two shares of new common for every 100 of the old.

COLORADO FILES PLAN

Colorado Fuel & Iron Co., Denver and Pueblo, Colo., on March 12 made application to reorganize under the federal bankruptcy act. A hearing was set for April 29 in Denver. John D. Rockefeller Jr., a heavy owner of Colorado securities, has accepted the plan, which involves a complicated exhange of securities.

FORGINGS NET IS $31,040

Pittsburgh Forgings Co., Coraopolis, Pa., reports net profit of $31,040, or 14 cents a share in 1934, compared with net loss of $73,781 for 1933. Greenville Steel Car Co., Greenville, Pa., a subsidiary of Pittsburgh Forgings Co., showed net profit of $164,330 in 1934, against $4781 in 1933. The latter subsidiary is not included in the Pittsburgh Forgings Co. statement.

EASTERN OFFERS STAINLESS

Eastern Rolling Mill Co., Baltimore, reports 1934 loss of $163,380, before depreciation, compared with $101,604 in 1933. During the year it completed installation of a 4-high cold rolling mill and has entered the stainless steel market through installation of modern equipment for grinding and polishing alloy sheets.

CRUCIBLE NETS $75,157

Crucible Steel Co. of America, New York, reports net profit of $75,157, after charges, in 1934. In the last half net loss was $636,876, compared with profit of $712,034 in the first half. In addition to the amount earned from operations the company's surplus last year was increased $421,063.

OTHER FINANCIAL REPORTS:

Otis Steel Co., Cleveland, 1934 net of $560,891, equal to $4.87 on the prior 7 per cent preferred; 1933, loss of $1,509,528.

Warren Foundry & Pipe Corp., Wharton, N. J., 1934, net of $351,277; 1933, net of $130,918.

Fairbanks, Morse & Co., Chicago, 1934, net of $563,847, equal to $8.58 on the 7 per cent cumulative preferred.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., 1934, net of $189,562; 1933, loss of $8,636,841.

Spang, Chalfant & Co., Pittsburgh, 1934, net of $820,812; 1933, loss of $910,692.

National Supply Co. of Delaware, including Spang, Chalfant & Co., 1934, deficit of $121,486; 1933, loss of $2,815,960.

Foreign Trade

HEARINGS begin Monday (March 18) on a proposed reciprocal trade treaty with Canada. While no official representing the steel industry probably will be present, it is believed in trade quarters that the American Iron and Steel institute, following custom, will file a protest over proposed reduction of tariff rates on steel.

Steel importations from Canada are relatively light but the favored-nation clause which would extend some privileges on products specified to larger producing foreign countries give special importance to the proposed agreement. To date, the Institute has filed protests at the time of hearings in the case of Sweden, Holland and Belgium.

SOVIET STACK AT CAPACITY

Fourth blast furnace at the Kuznetsk plant blown in Dec. 21 in a temperature of 50 degrees below zero Fahr. reached its rated capacity on Jan. 5, yielding 1190 tons of pig iron that day and 1181 tons the next, according to the *Bulletin of Economic Information* of the soviet chamber of commerce.

CONTINUE SUBSIDY ON IRON

German Pig Iron Syndicate is continuing in 1935 its policy of refunding members 14 reichs marks ($5.60) for each metric ton of pig iron used in the manufacture of products sold for export, according to Vice Consul Wright, at Cologne, to the department of commerce. However, German foundries this year must cover at least 95 per cent of their pig iron requirements at home instead of 85.

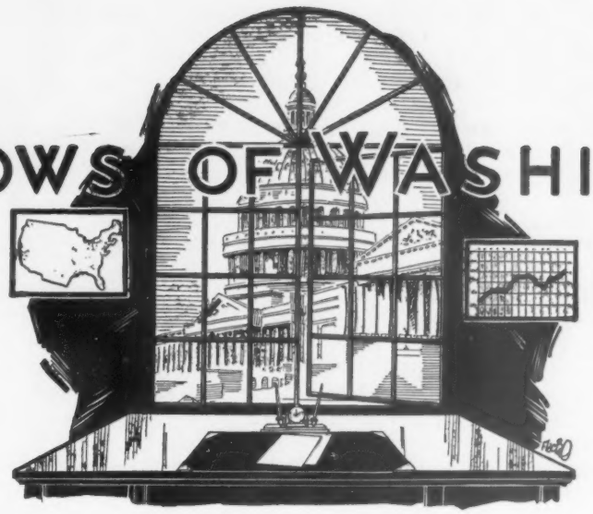
Transportation

ANNUAL report of Lake Carriers' association, Cleveland, shows the size of the freight fleet, both American and Canadian, on the Great Lakes to be 819 vessels with a carrying capacity of 4,457,410 gross tons per trip. Bulk freighters, carrying principally iron ore and coal, constitute 84 per cent of the number and 91 per cent of the capacity of the total.

Safety

NATIONAL Safety council, Chicago, recently checked injuries in the steel industry for 1933. Using 1929 as 100 for a frequency index, it rated departments of the steel industry as follows for 1933: Coke plants, 145; blast furnaces, 36.9; open hearths, 56.4; blooming and billet mills, 88.9; merchant mills, 94.3; pipe mills, 74.5; rod and wire mills, 66.4; sheet mills, 55.2.

WINDOWS OF WASHINGTON



WASHINGTON

IT MAY be the new deal's idea of expediting recovery, but while steel producers in the provinces were trying desperately last week to hold steel production above 45 per cent and prevent any layoffs of labor, Washington was after steel and its pricing methods like a pack of hounds after a fox.

From the federal trade commission and NRA emanated the most exhaustive studies and critical analyses of every phase of steel marketing seen in the capital since the palmy days of the Pittsburgh-plus investigation of 1920-24. On Capitol Hill senators contributed to the hunt by introducing a bill to outlaw "the Pittsburgh-plus plan".

The only advantage accruing to steel—and it was a doubtful one considering the cost—was that the industry at least has its fighting clothes on. Driven to bay, it at least achieved a sense of personal relations and, to the great distress of Washington, issued its interpretation of the basing point system a day prior to the release of the government's attacks.

Great Day for Crucifiers

For business generally, the implications were ominous. Here was the administration, supposedly awake at last to the necessity for effecting recovery prior to reform, hounding such a basic industry as steel at the same time it was attempting to crucify public utility holding companies.

Incidentally, there is some speculation whether such a company as Bethlehem Steel comes within the purview of the Rayburn-Wheeler utilities bill because it is the source of over half the gas supply of Baltimore.

There may be some exceptions to cataloging NRA as running with the hounds because, in a sense, its report is a partial defense of the present basing point plan, but it too proposed very definite and far reaching revisions of the present steel pricing methods.

The trade commission and NRA having supplied the newspapers of the country with reports two inches deep on full magazine pages, the question in Washington is "so what?"

The reports, it will be recalled, were submitted to the President in response to his executive order last May 30 in extending the steel code. The presumption, therefore, is that some move is up to the President, and such action would take the form of an ammendment or revision of the steel code.

FTC Given Slight Edge

At the moment, the federal trade commission rates higher at the White House than NRA, the latter being in the nature of a stepchild which has been wished off on congress for fear it may become too great a political liability in the 1936 elections.

There is, however, an offset in the fact that Donald Richberg, former chief counsel for NRA and now chief co-ordinator for the President, is closer to the President than the trade commission, and is a government member on the steel code authority.

It is too bad for steel that it is thrown to the wolves at a time when Washington is upset. The President is ill at ease and disturbed over the patent failure of many phases of the new deal; congress is just beginning to feel its oats, and, wrought up by many issues, including Huey Long, is in a cantankerous mood.

Both in the White House and in congress the feeling toward steel is decidedly hostile, and the recent decision by Judge Nields in the Weirton case knocking the foundations out from under sections 7a has done nothing to pacify congressmen who are responsive to the American Federation of Labor. Probably within the next week the situation will clear and a course of action action present itself.

It will be recalled that, after strenuously fighting the Pittsburgh-plus procedure before the trade commission from 1919 to 1924, the steel industry as typified by the United States Steel Corp. accepted the trade commission's "cease and desist" order of July 23, 1924, and put into effect the multiple basing system that continued until Aug. 17, 1933, when the steel code took effect.

The speculation now is whether the steel industry will voluntarily go half way or will resist any modification. A year ago, when the tide was running with the new deal, acquiescence would have seemed a sure thing. Now, with the tide running out, steel may choose to fight a rear guard action in the hope of an overturn in Washington before the pricing system it has built up over a period of years is destroyed.

Calendar of Events

The mechanics of the present situation are as follows: The trade commission submitted its report to the President Nov. 30. NRA held back its report while Mr. Richberg made an effort to reconcile the two. Failing in this, the White House gave its approval for separate publication. From last Tuesday to Thursday the official reports were issued to the newspapers for release Friday. On Wednesday, the American Iron and Steel institute forestalled the government and issued its defense.

Substantiating the prediction of this department last week, Senator Bankhead and Representative Huddleston, both of Alabama, introduced

bills outlawing what they term "the Pittsburgh-plus plan".

The gist of the Bankhead-Huddleston bill is in section 4 which provides that "it shall be unlawful for any person engaged in commerce, in the course of such commerce, to add to the shipping point price of any goods, wares, or merchandise, a charge for delivery to a destination which is other than the actual cost of such delivery, through such agency as the buyer shall specify."

In introducing the bill, Senator Bankhead recounted the activities of the trade commission in the 1919-24 investigation, explained the cease and desist order, and charged that "following that action, another and different system was established by the steel manufacturers for making prices which did not comply with the purpose and spirit of the order of the commission, and consumers never had the advantage of free and open competition throughout the country in the matter of prices for steel. When the steel code was adopted, the Pittsburgh-plus plan was reinstated in full, with some local modifications."

Presumably the bill will be heard by the subcommittee of the senate finance committee which is now considering the various proposals for extension of NRA.

Richberg Stout Defender

One defender at least has the steel industry in Washington in the person of Mr. Richberg. Apparently the administration's buffer in the senate investigation of NRA, he refuted the allegation of Senator Borah that profits up to 800 per cent have been made since the steel code was adopted.

While not using his name, Mr. Richberg ridiculed the statement of the senator from Idaho and said that prices in the steel industry under the code increased from the depression low of $41.96 per ton to $47.50 per ton as against the boom price of $50.45 per ton.

At the same time, he argued, payrolls increased from $13,000,000 to $42,000,000 and the volume increased from 26 per cent of capacity to a high of 60 per cent and a present rate of 45 per cent, while weekly wages rose from $11.52 per week to $19.12.

Mr. Richberg told the committee that when the code was formed it was a question of putting 75,000 men to work or squabbling over the Pittsburgh-plus system which had been fought over for 10 years without reaching any decision on its legality. He stated that NRA feels that economically a more sound basing system might be advised.

Almost a week was spent by the senate finance committee on examining and cross-examining Mr. Richberg. He told the committee that the A.F. of L. is unanimously in favor of continuing NRA, and also the United States chamber of commerce by a vote of 1495 to 419. He told the committee also that he could bring battalions of business men to appear before it, whereat Senator Harrison, chairman, said that he didn't want to hear any "battalions" but that the committee probably would call some of the business and industrial leaders of the country to get their ideas before the hearings are concluded.

There is considerable difference of opinion regarding the investigation now going on. In the first place, it looks like it will last until about the time for the recovery act to lapse, in June. Again, it is the idea of some that the committee is out to "whitewash" NRA. Apparently it is going to be impossible to do that because a great deal of sentiment is showing against its continuance.

Those who have been watching this matter closest and are said to have their ear to the ground are of the opinion that in the end congress will prolong the life of NRA but in so doing they will change the present system.

Again, there is difference of opinion among the NRA officials themselves. Some think that Mr. Richberg went far out of his way in trying to defend the organization when he was on the stand, knowing full well as he does, just what its weaknesses are.

He was followed on the stand by S. Clay Williams, chairman of the industrial survey board, who has already tendered his resignation to the President effective in a couple of weeks.

PERKINS WANTS LABOR BOARD; COOL OFF ON WAGNER BILL

The path before the Wagner-labor disputes bill, which industry is violently opposing because it would outlaw employe representation plans, has not become any smoother because of a difference between Secretary of Labor Perkins and Francis Biddle, chairman of the national labor relations board.

Miss Perkins, incidentally, has taken several raps from the President lately. She opposed the cigarette code and extension of the automobile code and is not wholly in accord with the treatment proposed for social security. Her influence at the White House has been lessening.

Testifying last week before the senate labor committee, which is hearing the Wagner bill, she disagreed with Mr. Biddle on the disposition of his labor board. The Wagner bill visualizes the labor board as an independent agency, which accords with Mr. Biddle's thinking. Miss Perkins, on the other hand, would like to corral this function for her own department.

Increasingly sensitive about being photographed at random, she became aroused when a photographer snapped her in the course of her testimony; she demanded, and received, the plate from the photographer.

The impression is growing in Washington that the administration is not in favor of the Wagner bill. The President, it will be recalled, squelched a similar bill at the last session of congress and at a recent press conference said he wanted to get other things out of the way before taking up the new bill.

"It is a matter of common knowledge," said Senator Wagner in his testimony on his bill, "that the principles of section 7a of the recovery act have been flaunted at the very crucial spots where their observance is most essential. This does not inflict injuries upon one group alone.

Unjust, Unfair, Disastrous

"It is unjust to employes who have seen what was handed to them as a new charter being treated as a meaningless gesture. It is unfair to the vast majority of employers who are anxious and willing to obey the law, and who are faced with the destructive competition of those who seek to gain advantage by disobeying it.

"It is disastrous to every economic interest because it is a main cause for the reappearance of those very tendencies which brought collapse in 1929, and which will certainly bring it again if they are not checked."

The main provisions of this Wagner labor disputes bill are: (1) re-enact section 7a of the recovery act in clarified form, and make it of general application to all industries affecting commerce, rather than merely the codified industries; (2) outlaw the company union; (3) firmly establish the principle of majority rule; (4) center the protection of all collective bargaining rights in a permanent and independent national labor relations board, with power of subpoena and investigation, and to insure cease and desist orders against violations enforcible in the federal courts; (5) provide that the activities of the various industrial boards in handling cases of the 7a type shall be subject to the supreme national board entrusted with final administrative interpretation of the law.

Letters have been flooding into congress on the Wagner and the Black-Connery 30-hour week bill. Typical is one from W. Hume Logan,

(*Please turn to Page* 32)

MIRRORS OF MOTORDOM

DETROIT

THE automobile industry is a strange mixture—co-operation and even camaraderie among executives, engineers and manufacturing divisions; cut-throat competition of the tooth and claw type in sales!

Walter Chrysler, Alfred Sloan, Alvan Macauley and other tops are virtually pals. For all his lone wolf instinct and his refusal to sit in on conferences and join the code, Henry Ford circulates more than is generally realized. As the years accumulate, he desires more and more to be known as a good fellow.

When a Chrysler engineer becomes curious about a certain part on a Hudson he need only pick up the telephone, and Hudson is glad to send the drawings over right away. There are no secrets and few patents in the industry, and besides, anyone can buy a car and tear it down.

Should Packard be caught short of a standard material and an expensive shutdown of its assembly line be threatened, any other automobile manufacturer or body plant in Detroit having a supply will rush it over.

SALES STAFFS IN FRENZY

But sales, especially in the low price field, are something else. It is for the printed page to hint and not to relate precisely the manner in which sales organizations pick rival cars to pieces, how they appraise the mechanical and body virtues claimed by the opposition, and how they compare the prices and values of their competition.

Not that the quality of personnel or the ethics of the sales departments is deficient; far from it. But, with the exception of Ford, Wall Street quotations on automobile stocks are the barometer of the industry, and the pressure for sales is intense. No matter what designers or engineers evolve, it is up to selling staffs to market it.

Somehow or other, despite the good fellowship at the top, almost every year stories of mechanical shortcomings get into circulation. A sales department will work up a lather of indignation over the whisperings of a rival, then proceed to lay down a counter barrage. It only adds zest to a calling that attracts some of the smartest merchandising minds of the country.

Last year, Ford dealers appeared to have done absolutely nothing to check a rumor that was not at all reassuring concerning Chevrolet's knee-action assemblies. And there were some who suspected that Chevrolet's billboard campaign displaying its engine with the caption, "So good it never needs to be replaced," might be a thrust at the Ford offer to replace its engine for about $50.

STEEL BODY NEEDS DEFINITION

This year probably will not pass without the low price field getting into a tangle, and at present steel bodies loom up as the bone of contention. This is not to impute any sharp practice in advertising, but the term "steel bodies" is being used in a manner that implies "all-steel bodies" to the layman, and the argument may be, "What is an all-steel body?"

Fisher is pushing the steel "turret top" it is now supplying for Olds, Pontiac and the master Chevrolet, and presumably also for Buick, LaSalle and Cadillac for their 1936 series. It is true that steel carries the load, but there still is some wood in the doors and in the bottom—enough, at least, to bar it from being strictly "all steel."

Incidentally, Fisher's tests with its composite bodies, such as it made last year, showed this type meeting service requirements by a wide margin, but competitors so emphasized steel that Fisher could not afford to stand out.

Chrysler ads portray its various models rolling over and over, dropping off cliffs and being subjected to severe strain, yet Chrysler cannot lay claim to an all steel body for the reason it still uses a soft top. True, there is chicken wire in this top; nevertheless, it cannot qualify as a steel top in the accepted use of the term.

Ford also is in the Chrysler class in that it has a soft top, but it advertises "all steel."

On points, Hudson-Terraplane probably is the only maker who can talk about an all-steel body without a comeback, inasmuch as this year it is welding a sheet in place of the former soft top, and the body, with a sheet steel pan, rests directly on the frame instead of on wooden sills.

There is no question that steel is an asset in advertising bodies because it is synonymous with safety in the public mind. Whether the lead of Fisher and Hudson-Terraplane in the steel top will be followed remains to be determined; the summer sun and effectiveness of insulation against it will decide the issue. But at the moment, some of the advertising is provocative, and may lead to a war of words.

STREAMLINE UNDERSIDES?

Speaking of the steel pan under Hudson-Terraplane bodies, there are some in Detroit who believe that streamlining is only half done when it is confined to visible surfaces.

The frictional air drag between the bottom of a car and the road is as great a holdback, it is claimed, as blunt bodies, hoods and fenders used to be. And just as it is harder to paddle a canoe in shallow than in deep water, so the lowering of bodies has increased this drag. There may be a market for steel in pans underneath cars designed to eliminate pockets and break the suction.

One good proof of the effectiveness of beavertail rears in eliminating swirls was seen after snow storms this winter. Undisturbed by eddies, snow piled up on window ledges, causing

some speculation whether it may be necessary to equip rear windows with wipers.

Although the Mechanics Educational Society of America which called the 1933 tool and die makers strike is attempting to link forces with the American Federation of Labor and outside unions have shown slightly greater strength in the recent elections, Detroit still continues unapprehensive concerning an automobile strike this spring.

In event minority groups should display enough strength to menace loyal employes, a complete shutdown of affected plants is probable. Since three-quarters of employes have registered themselves as unaffiliated in the Wolman board elections, the industry is not so sure that this majority, desiring work above all else, would take the situation in its own hands.

A corrected summary of elections in the automobile industry is 121,722 voting, 88,028 unaffiliated, 13,696 members of employe associations, 7458 employes of A. F. of L., 6076 members of the Associated Automobile Workers of America, 546 members of the Mechanics Educational Society, and the remainder scattering except for 5600 blank or void ballots.

ASSEMBLIES AT SMOOTHER PACE

In case the industry should go down to avoid conflict, Chevrolet and Packard would be the hardest hit. Chevrolet is just attaining speed on its master models, while its competitors—Ford and Plymouth — have pushed out many more thousands of cars and have their dealers well stocked.

Packard is just getting under way on the new low-price job. It has been planning to corral considerable publicity by stress on the high degree of mechanization of its new facilities for making the low-price series, but is soft pedaling that for fear of supplying union labor with ammunition.

Notwithstanding an increase in assemblies, a number of layoffs at some plants are reported. These are due principally to the achievement of efficiency in production, the new models being shaken down to the place where production flows more smoothly.

Production took a sharp spurt last week when the total went to 97,090 units, compared with 87,000 the first week preceding and 84,000 the second. General Motors made 31,000 last week, compared with 25,400 the week before. Chrysler's total was 19,450, against 18,800, while Ford increased from 35,000 to 36,550.

Ford, however, may be pretty close to the peak. It will probably achieve the 160,000 scheduled for March but instead of 175,000 for April, the latest revision is downward to 152,000. Still the most sales-minded in its history, Ford is putting salesmen through extensive courses, using sound film projection equipment, cutaway models, charts, photos, and text books. In droves, Ford salesmen are taken to branch assembly plants for these courses.

Ford feels pretty set up because it has been invited to bid on 4910 cars for the war department March 23 and the government itself is trying to forget that it ever had a brush with Ford over NRA.

Ford is one reason why practically all idle railroad employes in the Detroit district have been recalled. In February, more than 30,000 cars of freight moved in and out of the Dearborn plant, exceeding the previous record of April, 1930. On one day of February 3029 cars were on track at the Dearborn plant, and 500 were waiting at Flat Rock to come in. This taxed the 92 miles of track in the Ford plant.

White Motor in Cleveland is starting delivery of a streamlined Indiana truck which is thoroughly modernized with a cadmium plated radiator grill, deep skirted fenders, and ventilated disk wheels. Pricing it at $695, White expects to deliver 10,000 of this 6-cylinder model this year.

Windows of Washington

(*Concluded from Page* 30)

president, Logan Co., Louisville, Ky., who maintains that if congress wants to do something for labor it should insist that farmers pay their hired hands not less than $2 a day.

Ordinary workmen erecting government work get $11.20 for an 8-hour day, whereas much farm labor only gets 80 cents more for two weeks work made up of 10-hour days.

By a four to one vote a senate subcommittee has made a favorable report on the Black bill. It is expected that the full committee will take the report up in executive session early this week.

WHITE HOUSE ABDICATES AUTHORITY TO WRITE BILLS

The administration is said to be very uncomfortable at the attitude now being taken by congress. That body has now been in session for four months and a half and not one of the major measures of the administration has yet been passed.

It is quite evident from the actions of members on both sides of the capitol that they are no longer ready to sign on the dotted line, and as an indication of this the White House, it is reported, has stopped sending completely written bills to the other end of Pennsylvania avenue.

Up to this time some of the routine appropriation bills have been passed, a number of other measures also have passed muster—but none of the important bills backed by the administration has yet become law.

This is about the time of the year when those who like to begin to guess when congress will adjourn. The guesses now are about the middle of the summer.

GUFFEY BILL GETS O.K.

The senate subcommittee which has been holding hearings on the Guffey coal control bill last week made a favorable report to the full committee urging its passage. The full committee has not yet taken action on this report.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	156,907	292,765
Feb.	105,447	231,707	335,000*
2 mo.	234,269	388,614	627,765
Mar.	115,272	331,263	.....
Apr.	176,432	354,745	.....
May	214,411	331,652	.....
June	249,727	308,065	.....
July	229,357	266,576	.....
Aug.	232,855	234,810	.....
Sept.	191,800	168,171	.....
Oct.	134,683	132,491	.....
Nov.	60,683	78,465	.....
Dec.	80,656	183,187	.....
Year	1,920,057	2,778,739	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Mar. 2	83,899
Mar. 9	86,375
Mar. 16	97,090

Claim Chrome Ore Find

Development work on deposits of chrome ore in Hellroaring Mountain, Mont., is said to have developed the fact 237,180 positive tons of 48 per cent ore is available. The probable tonnage of all grades is believed to exceed 3,225,000 tons. It is claimed that the ore can be delivered at important consuming points for 17.3 cents.

Export Meeting March 19

Export Managers Club of New York, 2 Lafayette street, has scheduled its annual get-together of export executives for the Hotel Pennsylvania, New York, March 19. Speakers already booked include C. W. Linscheid, manager foreign division of Fairbanks, Morse & Co.

Industrial Men in the Day's News

Hubert D. Tanner, Manager, Machinery Division, Pratt & Whitney Co.

Trained in mechanical engineering, for eight years he was engineer in machine and tool designing.

Later he devoted his talents to the development of gear grinding machines, with eminent success.

He has done extensive sales engineering work and has earned wide acquaintance in the automotive industry.

HUBERT D. TANNER, who as noted in STEEL for Feb. 25 has been appointed manager of the machinery division of Pratt & Whitney Co., Hartford, Conn., was born in Pawtucket, R. I. He was educated in mechanical engineering at Brown university and also attended the Rhode Island School of Design.

He was employed by Brown & Sharpe Mfg. Co., Providence, R. I., for eight years as an engineer in both machine and tool designing.

Becoming associated with Pratt & Whitney in 1920 as an engineer, he has been with the company continuously ever since. He has been in charge of the development of gear grinding machines.

Mr. Tanner also has done extensive sales engineering work for Pratt & Whitney which has taken him into many plants both in this country and abroad. He has a wide acquaintance in the automotive industry due to his work in connection with automobile transmission gearing.

He is a member of the American Society of Mechanical Engineers, the Society of Automotive Engineers, and the American Gear Manufacturers association.

□ □ □

F. S. Blackall Jr., president-treasurer of the Taft-Peirce Mfg. Co., Woonsocket, R. I., was elected president of the Special Tool, Die and Machine Shop institute, 1225 Guarantee Title building, Cleveland, at its recent annual convention in Cleveland. H. A. Stoddard, Interstate Mechanical Laboratories, New York, was elected vice president; G. A. Barth, Barth Stamping & Mfg. Co., Cleveland, treasurer; and George J. Huebner, secretary.

Roy T. Wise, former executive secretary of the code authority, resigned to become affiliated with the Ex-Cell-O Aircraft & Tool Corp., Detroit. He was made chairman of the code authority, on which are Messrs. Blackall and Stoddard, Miles Irmis, Superior Tool & Stamping Co., Chicago; C. R. Quine, Akron Equipment Co., Akron, O., and of which Mr. Huebner is secretary.

□ □ □

Walter A. Davis, recently a products manager for the American Iron and Steel institute, New York, has returned to the New York office of the Youngstown Sheet & Tube Co., 500 Fifth avenue, as assistant district manager.

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L. A. Rawson, manager of the derrick division of the Emsco Derrick & Equipment Co., Los Angeles, and Harry C. Morehouse, of the machinery division, have been elected directors of the company.

□ □ □

Lloyd J. Pinkowsky has been appointed purchasing agent of the Four Wheel Drive Auto Co., motor truck manufacturer, Clintonville, Wis., to succeed the late Guy H. Billings. He has been with the company since 1924, and assistant purchasing agent since 1928.

□ □ □

Thomas R. Langan, sales manager of the northeastern district, with headquarters at New York, for the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed traffic manager of the company, at East Pittsburgh. He has been identified with railroad electrification for many years.

□ □ □

Byron B. Morton, formerly plant metallurgist at the Baton Rouge refinery of the Standard Oil Co. of Indiana, has been appointed to the metallurgical staff of the International Nickel Co., New York. A graduate of Virginia Polytechnic institute, he will concentrate on problems of the oil industry involving nickel alloy steels.

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John S. Stanier, newly-appointed superintendent of the new cold-rolled strip mill of the Youngstown Sheet & Tube Co., Youngstown, O., is a graduate of Lehigh university, 1923, his studies having been interrupted by war service. From 1923 to 1928 he was connected with the former West Penn Steel Co., Brackenridge, Pa., in which he had spent nine summer vacations prior to college.

In 1928 Mr. Stanier, became special mill representative of the Newton Steel Co., and later was vice president in charge of operations. In 1933 he went with the Sheet & Tube company as superintendent of sheet mills, Brier Hill division, which he leaves for his new post. His 22 years' experience has largely been in the field of high grade sheet manufacture.

John S. Stanier

Mr. Stanier is the third generation

in a family of steelmakers. His grandfather — W. J. Stanier—came from Scotland in 1870 to be superintendent of rolling mills for the Linden Steel Co., Pittsburgh. His father — J. T. Stanier — who is now retired, was formerly with the United States Steel Corp., Allegheny Steel Co. and West Penn company.

□ □ □

L. G. Sullivan has been elected a vice president of the Atlas Steel Casting Co., Buffalo. He will continue in the New York office of the company, in charge of eastern sales.

□ □ □

W. J. Porter, superintendent, Sloss-Sheffield Steel & Iron Co., Russellville, Ala., on March 1 celebrated his twenty-seventh year with the company and took office as mayor of Russellville.

□ □ □

Athel F. Denham, for the past eight years Detroit editor of several automotive trade magazines published by the Chilton Co., Philadelphia, including *Automotive Industries*, has resigned to undertake an automotive technical advisory service on advertising and publicity, with headquarters at 1235 Lafayette building, Detroit.

□ □ □

B. D. Christian, with the Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., for 21 years, on March 1 was elected vice president. For the past nine years Mr. Christian has been general sales manager, and previously represented it in the Cleveland and Chicago territories. Due to a policy inaugurated by Mr. Christian, the Crocker-Wheeler company has retained its key men in designing, manufacturing and sales through the depression.

Died:

JOEL S. COFFIN, 74, chairman of Lima Locomotive Works, Lima, O., in Miami, Beach, Fla., March 11. Starting as machinist, fireman and engineer on the Michigan Central and Wisconsin Central railroads, he joined the Galena Signal Oil Co., rising to vice president. This post he left to become vice president of the American Brake Shoe & Foundry Co., from which he resigned in 1911 to devote all his time to the management of his own companies. He organized the American Arch Co. and assisted in developing the Locomotive Superheater Co. and the Franklin Railway Supply Co. He was chairman of the Lima Locomotive Works since 1916.

Mr. Coffin's passing followed by two days that of William L. Reid, vice president and general manager of the Lima Locomotive Works.

□ □ □

Herbert Charles Baldry, 49, vice president, Flour City Ornamental Iron Co., Minneapolis, in that city March 9.

□ □ □

William K. Wilson, retired president of the Snell Mfg. Co., Fiskdale, Mass., manufacturer of boring tools, in Brooklyn, N. Y., recently.

□ □ □

W. S. Shields, 74, well known civil and sanitary engineer and former president of the Illinois Society of Engineers, in Chicago, March 7.

□ □ □

Richard D. Illingworth, 33, inspector of ordnance for the Crucible Steel Co. of America, Harrison, N. J., prior to his illness, in Denville, N. J., March 9.

□ □ □

David H. Williams, 86, a pioneer in the tin plate industry in Indiana, and at one time general superintendent of a mill at North Anderson, Ind., recently in Ann Arbor, Mich.

□ □ □

Leonard B. Barde, 45, vice president and founder of the Barde Steel Co., Seattle, in Seattle, March 2. With his father, the late Morris Barde, he established the business in Seattle 15 years ago.

□ □ □

George W. Delany, 74, from 1900 until about three years ago secretary of the Reading Iron Co., Reading, Pa., in that city recently. Earlier in his career he served as secretary to three presidents of the Reading railroad.

□ □ □

Samuel H. Yonge, 94, at one time associated with the Baltimore Bridge Co., Baltimore, later prominent in river protection work, and identified with the erection of the Brooklyn, Niagara Falls suspension and Eads bridges, in Edenton, N. C., March 11.

□ □ □

Franklin C. Hockensmith, 81, founder and former president of the Hockensmith Wheel & Mine Car Co., Penn, Pa., in Los Angeles, March 10. He was born in Greencastle, Pa., later lived in Pittsburgh, but had lived in Los Angeles since his retirement in 1915.

□ □ □

Capt. Walter M. McFarland, United States navy, retired, and for 20 years manager of the marine department of the Babcock-Wilcox Co., New York, in Washington March 4. Retiring from the navy in 1899, he became a vice president of the Westinghouse Electric & Mfg. Co., resigning in 1910 to go with Babcock & Wilcox. He retired from active service with the company in 1931.

□ □ □

John Partridge, for more than 30 years prominently identified with the scrap business in Philadelphia, in Ridley Park, a suburb, recently. For the past several years he has been affiliated with the Philadelphia office of the Charles Dreifus Co., seller of iron and steel scrap, and prior to that was long engaged as a partner in the scrap business of Allen R. Harper Co., that city. He was born in Ridley Park about 53 years ago.

□ □ □

Henry C. McEldowney, 67, director of Pittsburgh Steel Co., Pittsburgh; Diamond Alkali Co., Fairport, O., and active in other industrial directorships, as well as being president of the Union Trust Co., Pittsburgh, in Atlantic City, N. J., March 9.

Mr. McEldowney became president of the Union Trust Co. in 1900, shortly after which he directed the handling entirely by his bank of a reorganization and consolidation of the Crucible Steel Co. of America.

□ □ □

James F. Leahy, 65, general superintendent of the Buffalo plant of the Farrel-Birmingham Co. and associated with the company 34 years, at his home in Kenmore, N. Y., March 6. In 1922 he and the late David R. Bowen accompanied Franklin Farrel Jr. to England, and upon their recommendations the company purchased American rights to the gear cutting process invented by W. E. Sykes, and acquired the plant at Buffalo where the Sykes gear machines, gears and related products are manufactured.

□ □ □

Theodore A. Gessler, 51, from 1911 until his retirement in 1922 manager of sales at New York for American Sheet & Tin Plate Co., at his winter home in Miami, Fla., March 3. He was first employed by American Tin Plate Co. in 1898, continuing with this company when it was taken over by the United States Steel Corp. and later merged into the American Sheet & Tin Plate. A fellow in Semitic languages and literature at the University of Chicago graduate school prior to 1898, he continued his interest in literature throughout his lifetime. For seven years he was mayor of Lake Hopatcong, N. J.

□ □ □

Bayard T. Bacon, 80, prominent in the pig iron business in Chicago until his retirement from Pickands, Brown & Co., in 1925, at his home in Oak Park, Ill., Feb. 25. Born in Hamilton county, Ohio, in 1855, Mr. Bacon entered the pig iron business in Cincinnati in 1876 with L. R. Hull & Co., remaining with E. L. Harper & Co. after it absorbed the Hull company. In 1882 he went with Rogers-Brown & Co. Four years later he became associated with Pickands, Brown & Co., Chicago, now a part of the Interlake Iron Corp. In August, 1920, he retired from active service and in 1925 severed all connection. He was a Mason. He is survived by a brother, C. S. Bacon, of Indianapolis, and one sister, Elizabeth W. Bacon, of Oak Park.

EDITORIAL

Go Slow in Tinkering With Basing Point System!

THAT two agencies of the federal government—after making exhaustive, independent studies of the multiple basing point principle—cannot agree as to whether it is good or bad is the best possible reason for going slow in changing the present system.

As expected, the federal trade commission brought in a report recommending that the government remove its sanction of multiple basing points when or if the NRA steel code is renewed. On the other hand, NRA officials submitted a brief which in general defends the system in principle, admits it has points of weakness which need correction and recommends that it be continued with such alterations from time to time as are necessary to curb palpable abuses. In other words, the trade commission would destroy the basing point system, while the NRA authorities would preserve it and try to improve it.

In appraising the merit of the conflicting arguments, interested persons will do well to consider the competency of their sponsors. On this score the NRA authorities have a unquestioned advantage over the trade commissioners. They have had opportunities to view at first hand the practical working out of extremely difficult problems arising in the routine business of pricing iron and steel products. They have heard the complaints from producers and consumers, witnessed the weighing of evidence, and known what determined the final decisions.

Federal Trade Commission Has Been Inconsistent in Treatment of Price System

What can be said for the competency of the federal trade commissioners? The commission, but not all of its members individually, can claim certain advantages accruing to its long period of dealing with the basing point problem. From Aug. 1, 1919—when the Western Association of Rolled Steel Consumers filed application to eliminate the then prevailing Pittsburgh-plus method of quoting finished steel—down to the present time, the commission has been in a position of authority and opportunity to secure an intimate knowledge of the subject.

The record of the activity of the commission during this period of 15½ years is significant, because it has a bearing upon the competency of the commissioners in the present report. During the first five years, the commission was engaged in hearings on Pittsburgh-plus, which led to the famous "cease and desist" order of July 23, 1924. As a result of this ruling, the single base system was abandoned when on Sept. 22 Chicago was inaugurated as a basing point.

For almost 10 years after the multiple-basing plan became effective, the federal trade commission paid no attention to the pricing of steel. But on Feb. 2, 1934, about six months after steel's NRA code was approved, Senator Borah persuaded the senate to pass a resolution asking the commission to investigate competition under the code. On March 19 the commission brought in a superficial report which condemned the multiple basing system severely.

Commission Ignored Multiple Basing Points for 10 Years; Then Suddenly Condemns Them

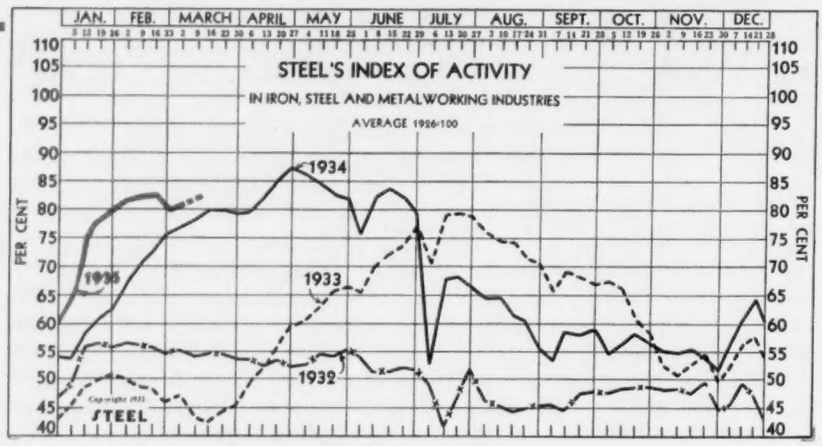
Thus from July, 1924 to February, 1934, the commission, while fully aware of the existence of multiple basing points, did not publicly question their legality. Under the circumstances, this voluntary silence on the part of the commission was equivalent to tacit approval of the system. Why the commissioners, who had condoned the plan for ten years, suddenly turned against it in 1934 is a pertinent question. Their inability to answer it satisfactorily is convincing evidence that their present efforts to destroy the basing point system are based upon ulterior motives rather than upon the merits of the case. The incongruity of their past and present attitudes is sufficient to bar their current report and its recommendations from serious consideration by those who desire sincerely to improve the method of pricing steel products.

Those who through ignorance, prejudice or political motives are bent upon destroying the basing point system fail to consider several important facts. First, the present practice is not a suddenly trumped-up device to fix or even control prices. It is a system embodying the experience of 50 years of evolution, during which time pricing has advanced from the vicious rebating, secret-concession-giving and other repugnant tactics of the eighties and nineties to the open-price, above-board method in use today. Progress has been slow, but sure.

Secondly, producers and consumers obviously cannot operate profitably under conditions which permit the frequent drastic changing of the rules. A continuing policy is essential.

The only constructive, practical course to pursue in connection with steel's pricing system is to continue it as it now exists and to be alert constantly to opportunities for improving it as rapidly as consumers and producers can assimilate the lessons learned from experience.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained* 1.1 *points to* 82.2 *in the week ending March* 9:

Week ending	1935	1934	1933	1932
Jan. 19	**78.1**	**60.9**	**49.8**	**56.2**
Jan. 26	**79.5**	**62.3**	**50.8**	**55.8**
Feb. 2	**81.8**	**66.9**	**49.9**	**56.2**
Feb. 9	82.7	70.7	48.7	56.0
Feb. 16	82.8	72.4	48.3	54.4
Feb. 23	80.5	75.5	46.0	55.1
Mar. 2	81.1†	76.8	47.4	54.1
Mar. 9	82.2*	78.6	43.4	54.8

†Revised. *Preliminary.

Business Holds Steady Pace In Spite of Obstacles

RECENT week-to-week fluctuations in the rate of industrial activity have been relatively unimportant. For two months—from mid-January to date—the curve of activity has clung persistently to the horizontal. During that period STEEL'S index, charted at the top of this page, has hovered around a median line slightly above 80 and has not moved more than several points above or below it.

This indicates a condition of stability which is decidedly preferable to the violent fluctuations which followed the spring spurt of 1934. Many companies, which made profits in the first half of last year, suffered deficits in the last half which wiped out or seriously impaired the good showing of the first two quarters. Profits will be greater, employment will be more satisfactory and business sentiment will be stronger if industry can maintain a reasonably consistent rate of activity, rather than one which rises and falls violently.

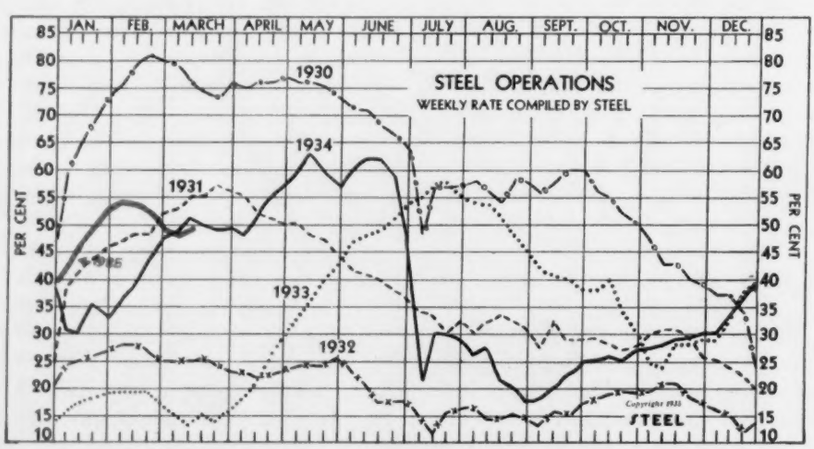
The outlook for a continuance of business at or near the current volume is more favorable than otherwise. Much of the pessimism found in certain quarters can be traced to the political situation. Business should know by this time that the bark of congress is worse than its bite. While the threat of ill-advised legislation must be considered in a long-range view of the business outlook, it can be discounted in contemplating the prospects for the second quarter.

Favorable Signs Offset Uncertainties Due to Political Complications in Congress

Encouragement can be found in the fact that the peak in automobile production, agricultural implement and certain household equipment items still is ahead. The continued output of electric power at almost record levels is a good sign. Abnormal shipments of coal in anticipation of strike trouble cloud the significance of present figures on freight traffic. The action of two companies in arranging for large bond issues through private financing is reassuring. Reduction of the federal debt by even a mere two-thirds of a billion is a move in the right direction.

These favorable omens offset in part the disconcerting political intangibles.

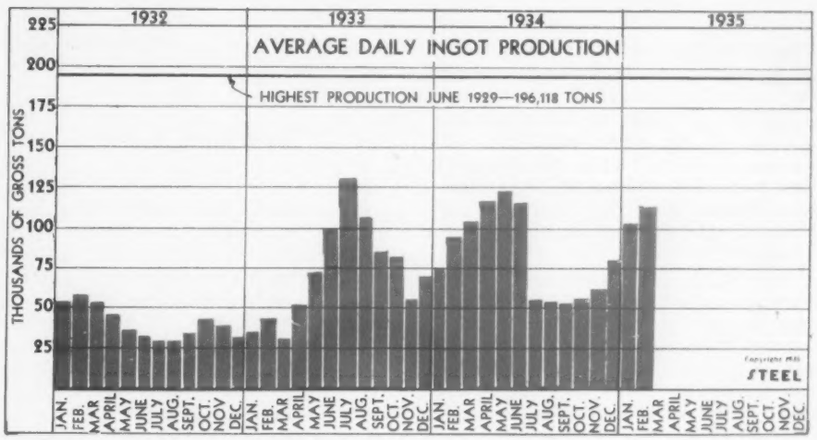
1935	Per Cent
Mar. 9	50
Mar. 2	48
Feb. 23	50
Feb. 16	53
Feb. 9	54.5
Feb. 2	54.5
Jan. 26	53
Jan. 19	51
Jan. 12	45½
Jan. 5	42½
1934	
Dec. 29	39
Dec. 22	37½
Dec. 15	33½
Dec. 8	30
Dec. 1	28



1934	Per Cent
Mar. 10	51
Mar. 3	48
Feb. 24	47
Feb. 17	43
Feb. 10	39
Feb. 3	36
Jan. 27	33
Jan. 20	35
Jan. 13	30
Jan. 6	31
1933	
Dec. 30	36
Dec. 23	38
Dec. 16	33
Dec. 9	29
Dec. 2	29

February Ingot Output Highest in Eight Months

	1935	1934	1933
	Gross Tons		
Jan.	104,969	73,007	39,110
Feb.	114,255	90,965	44,709
March	.....	102,275	33,268
April	.....	115,912	53,817
May	.....	124,177	73,201
June	.....	116,006	98,632
July	.....	58,912	126,734
Aug.	.....	50,503	106,058
Sept.	.....	50,068	87,811
Oct.	.....	54,151	80,188
Nov.	.....	61,126	58,507
Dec.	.....	77,664	71,944



Finished Steel Shipments Continue Climb

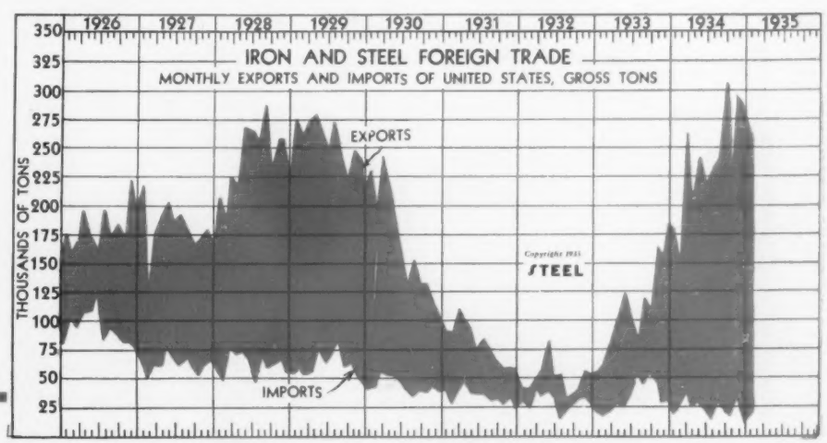
Gross Tons

	1935	1934	1933
Jan.	534,055	331,777	285,138
Feb.	583,137	385,500	275,929
March	.....	588,209	256,793
April	.....	643,009	335,321
May	.....	745,063	455,302
June	.....	985,337	603,937
July	.....	369,938	701,322
Aug.	.....	378,023	668,155
Sept.	.....	370,306	575,161
Oct.	.....	343,962	572,897
Nov.	.....	366,119	430,358
Dec.	.....	418,630	600,639

January Steel Exports Up 32 Per Cent Over 1934

Gross Tons

	1935		1934	
	Imports	Exports	Imports	Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	.....	.....	25,407	151,184
Mar.	.....	.....	38,393	261,269
April	.....	.....	26,862	201,539
May	.....	.....	29,465	241,753
June	.....	.....	24,848	219,406
July	.....	.....	17,676	233,186
Aug.	.....	.....	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764



Improved Equipment and Alloys Lend Facility to Die Casting of Brass

BY CHARLES B. JACOBS JR.
American Brass Co.,
Waterbury, Conn.

DIE casting of low melting point metals and alloys has been practiced for years, but only recently has it been possible to obtain die castings of the higher strength copper-base alloys. This development was delayed until satisfactory alloy steels were available for dies, and suitable casting equipment was designed.

Successful die casting of brass provides a highly corrosion resistant product with high tensile strength, rigidity, hardness, resistance to shock and abrasion, and the absence of aging changes. Brass die castings can be supplied with a minimum tensile strength of 85,000 pounds per square inch and with elongation of 8 per cent.

Special Machines Required

Brass die castings occupy a position between brass forgings or hot pressed parts and sand castings. They are supplemental rather than competitive to forgings and are substituted for wrought parts where the design is complicated and involves coring, thus eliminating extensive machining operations. Pressure die castings are finished to more precise dimensions than sand castings and possess a superior surface, in addition to generally higher physical values. Usually, little, if any, machining is necessary to finish a die cast part.

The plunger and goose-neck type of die casting equipment has been in use for some time for casting low melting point alloys. As certain parts of the working mechanism in this machine are immersed in the molten metal, it is obviously unsuitable for casting alloys with the relatively high melting points of the brasses. For casting the higher strength, higher melting point metals, a separate melting chamber is essential and two such types of equipment have been developed. One machine was designed by Charles Pack and developed in the Ansonia, Conn., plant of the American Brass Co. The other was developed by Joseph Polak, of Prague, Czechoslovakia. Both of these machines require a separate melting pot in which the metal is maintained at a proper casting temperature until it is ladled into the pressure chamber or "cup" of the machine.

Metal Both Liquid and Plastic

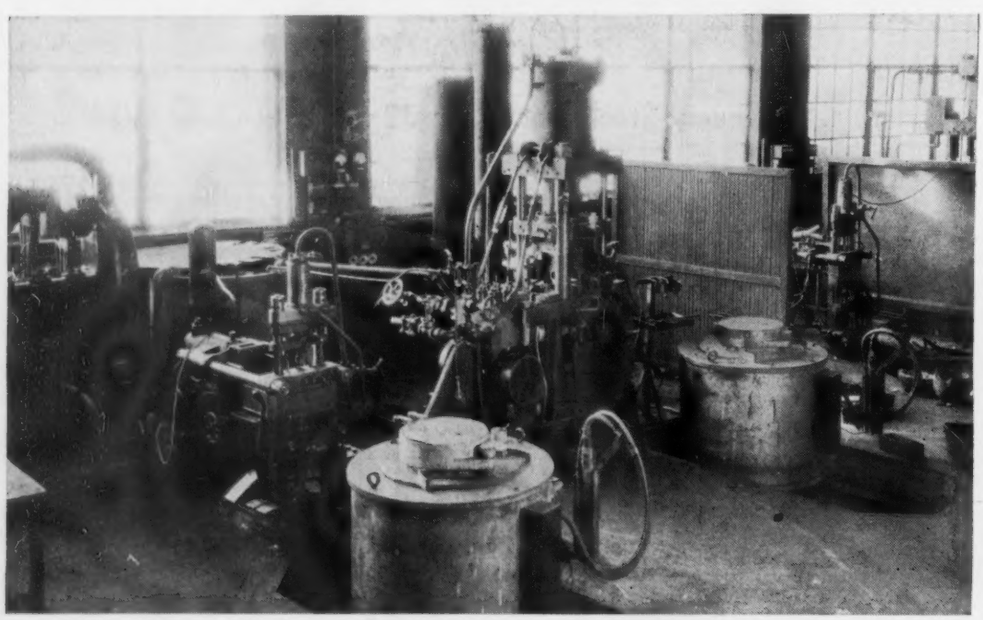
The bottom of the cup of the Pack machine is formed by a plunger, and the upper die is constructed so that it covers the top of the cup and also provides a gate into the die. An upward motion of the piston forces any metal in the cup into the die cavity. The entire gate remains attached to the casting. In this machine either liquid or semi-molten metal can be cast. The general practice is, however, to use liquid metal.

The Polak machine requires that the metal be in a plastic condition before it is forced into the die. The use of metal in a plastic condition permits lower operating temperature with consequent saving in die life.

60-40 Brass Most Widely Used

While both the Pack and Polak processes permit the use of casting temperatures much higher than those possible with the older processes, there are still limits to the temperature under which the steel dies will show a practical service life. However, the development of special alloys for die casting procedure provides a range of physical properties comparable to those available in forged parts. The Polak equipment is, of course, limited to compositions having an appreciable plastic range. Metals and alloys with a narrow temperature interval between the liquidus and solidus curves can be cast successfully only in a Pack machine. However, a number of serviceable brass alloys can be adjusted to meet the requirements of plasticity.

Brass of 60 per cent copper and 40 per cent zinc has the lowest melting point of the commercial brasses, and for this reason is the most widely used for brass die castings. Other elements, however, are added to obtain certain characteristics peculiar



SMALL model Polak (left) and Pack (right) brass die casting machines, showing holding pots in the foreground in position for casting

Effect of Section and Lead Content on Properties of Casting Alloys

Alloy	Composition, Per Cent					Physical Properties: Tensile Strength, Lbs./Sq. In.			Elongation, Per Cent in 2 Inches			
	Copper	Tin	Lead	Aluminum	Zinc by Diff.	Flat ⅛ x ½-in.	Round ¼-in.	Round ½-in.	Flat ⅛ x ¼-in.	Round ¼-in.	Round ½-in.	Charpy impact, ft.-lbs.
Die Castings												
X-6	61.18	1.05	0.29	0.06	37.42	55,050	57,750	47,420	8.0	10.5	9.6	15+
X-7	61.10	1.01	0.80	0.03	37.06	56,020	56,450	50,480	6.0	10.4	11.9	15+
X-9	60.68	1.08	1.75	0.01	36.28	53,320	56,480	45,400	5.5	8.8	8.6	13.7
X-8	60.58	0.98	1.92	0.02	36.50	51,240	54,620	46,660	3.1	7.9	9.6	13.0
			Silicon	Mang.								
Everdur 1026	80.74	.....	4.63	0.12	14.51	83,600	88,930	80,470	7.0	12.0	9.3	15+
Sand Castings—A. S. T. M. Specifications Requirements												
B60-28	88	8	.....	.....	4	.....	.....	35,000	.....	.....	15	.....
B62-28	85	5	5	.....	5	.....	.....	26,000	.....	.....	12	.....
B65-28	63.5	.....	2.5	.....	34	.....	.....	20,000	.....	.....	15	.....
			Iron									
B59-28	87-89	0.5	2.5-4.0	7-9	.....	.....	.....	65,000	.....	.....	20	.....
						Lead						
B54-27	55-60	0.0-1.5	0.0-2.0	0.0-1.5	38-42	0.0-0.4	.....	65,000	.....	.....	25	.....

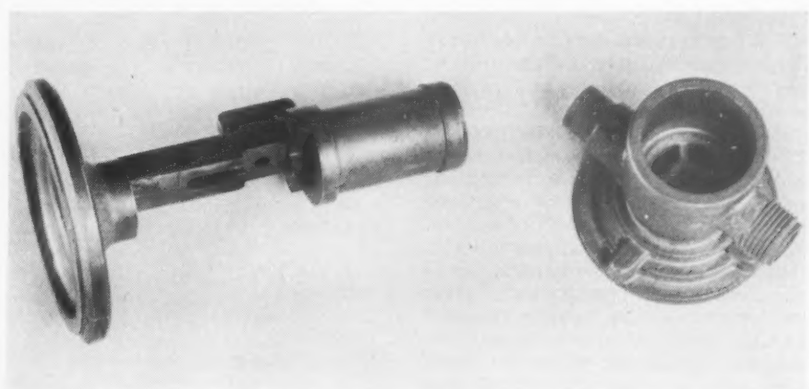
to the die casting process. The plastic range of the high brasses is narrow but may be increased greatly by the addition of a small percentage of lead, due to its immiscibility in the molten condition in the brass alloy. Lead also, as is well known, improves machinability of brass.

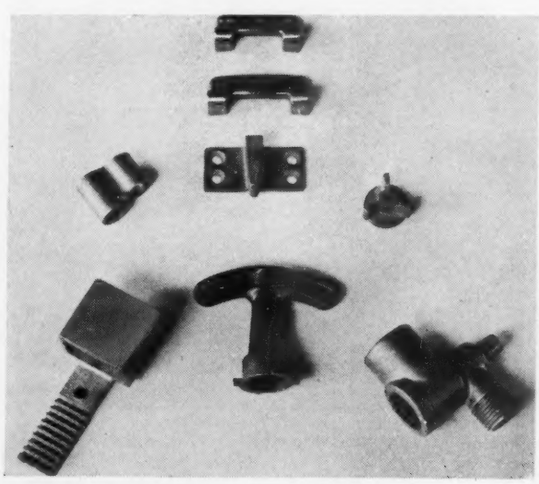
Aluminum Inhibits Oxidation

In the die casting process the metal obviously must be maintained for appreciable periods at casting temperature in the holding pot where it is uncovered and subject to continual oxidation by the atmosphere. In the plastic or "mushy" state the oxide formed is not readily skimmed from the surface. The addition of small quantities of aluminum has been found to inhibit this oxidation and is apparently generally used both in European and American practice. Aluminum also reduces the vaporization of zinc in the holding pot and diminishes deposit of zinc oxide on the die surfaces. Tin is also added, giving increased fluidity to the alloy in the casting, tending to inhibit segregation of lead in the holding pot when semi-plastic metal is being used, and increasing corrosion resistance of the final casting.

The alloy found most suitable for general die casting purposes has the following nominal composition: Copper, 60; tin, 1; lead 1; and aluminum, about 0.10 per cent, the remainder zinc. It has the following minimum physical properties: Tensile strength, 55,000 pounds per square inch and elongation in 2 inches, 9 per cent.

In addition to the common brasses, certain high silicon alloys have been found eminently suited for die casting practice, having low melting points (about 900 degrees Cent.), good fluidity and high strength. Everdur metal No. 1026, a patented alloy manufactured by American Brass, has proved one of the most satisfactory compositions of this type. Its nominal composition is: Copper, 81.50; silicon, 4.25; and manganese, 0.15 per cent, the remainder zinc. It shows minimum tensile strength of 85,000 pounds per square inch and elongation of 8 per cent in two inches.





BRASS die castings above illustrate intricate coring. Valve part is cored four ways, while the adjacent casting has six cores. At the left is shown a miscellaneous group of small brass die castings. Note smooth surfaces and sharply defined edges

Tests Reveal Strength Factors

Results of tests to determine the effect of section and of lead content are given in the accompanying table. Test bars were cast in a Pack machine, the small one in accordance with recommended practice of the committee on die casting of the American Society for Testing Materials and the larger diameter bars (0.505-inch) to conform to recommended practice for sand castings.

All specimens were tested "as cast" without machining the surface, only the fins and gates being removed. The ability to cast a heavy section of this size is in itself an interesting illustration of the capabilities of the process.

Size of Section Influences Tensile

It is evident from the data in the table that the tensile strength of the heavy section is in general appreciably lower than the strength of the smaller section. This is undoubtedly associated with the slower cooling and less depth of chill of the castings. There is no appreciable effect of size of section on ductility of cylindrical specimens although the values shown by the flat section are, in general, lower. This is probably related to shape of test piece as well as greater area of chill for a given mass. It should be pointed out that the flat test bar was finally abandoned by the American Society for Testing materials committee on die castings as not sufficiently representative due to rather wide variation in results. Increasing lead content causes an appreciable decrease in the ductility and impact resistance. Fifteen foot-pounds was the capacity of the testing machine used.

It is of interest to compare the physical properties of brass die castings with some of the standard sand casting alloys, certain properties of which have been given in the table for ease of comparison. It is evident that the die cast alloys in general show superior tensile strength and lower elongation.

Limitations of Die Castings

Commercial scale production of brass pressure die castings is comparatively recent and the possibilities of the procedure, as yet, have been only lightly probed. As is the case with all other specialized production methods, pressure die casting has its definite limitations, but with proper development of applications, it should be a valuable contribution to the field of fabrication of metal parts.

Heavy Steel Plates Used in All-Welded 20-Foot Penstocks for Norris Dam

TWO large penstocks for the Norris dam of the TVA project, 20 feet in diameter, and varying in thickness from 1⅛ to 1⅜ inches, recently were completed by Chicago Bridge & Iron Works. The "electronic tornado" system of welding was used for the part of the work which was automatically welded. This system utilizes a magnetically controlled carbon arc which, combined with the proper flux, gives weld metal of the quality required by A. S. M. E. class 1 welding specifications under which the work was done. After sections of pipe had been fabricated by automatic welding, they were transported to their place in the dam and joined together by manual shielded arc welding.

Welding in Shop and Field

Norris Dam, first of six in the TVA development, is located about 25 miles northwest of Knoxville, Tenn. It will be 253 feet high from foundation to roadway, 210 feet thick at the base, and 1800 feet long at the crest. The waters impounded by the dam will form an artificial lake of 3,600,000 acre-feet covering some 80 square miles with a shore line of more than 800 miles. Cost of the dam is estimated at about $34,000,000. Two 60,000-horsepower generating units will be installed in the power house.

Each of the two penstocks was built of plates formed in semi-cylindrical sections at the Birmingham Ala., plant of Chicago Bridge & Iron and shipped to the site of the dam.

At a field fabricating plant four plates were welded together to form a section 20 feet in diameter by 20 feet long. The heaviest of these sections weighed approximately 40 tons. Automatic welding at the field plant was carried out as follows: First, two plates forming a cylindrical section 20 feet in diameter 10 feet long were tack welded together in a special fitting-up form. The seams joining these plates then were welded by the automatic welder. Two of these 10-foot sections then were tack welded together and placed on power driven rolls which turned the pipes for making the automatic circumferential weld. All automatic welds were of the double-U type.

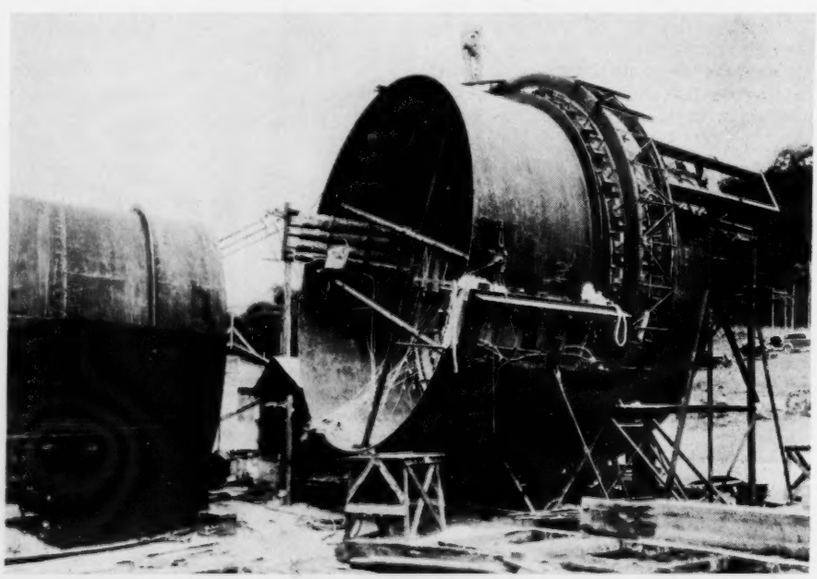
As a means of stiffening the penstock a steel ring 1 7/16 x 8 inches was welded around the outside of each 10-foot section.

Welds Were Stress Relieved

After welding, all welded seams were X-rayed and all defects disclosed by the X-ray photographs were repaired. The welded joints were then stress relieved electrically, as shown in the accompanying illustration. After being heated to proper temperature the welds were allowed to cool uniformly with the heating elements and insulating blankets in place. During heating and cooling, protection from the weather was provided by a temporary housing erected over the pipe.

Tests were made of the welded joints by cutting samples from test plates welded under identical conditions. The specifications for the work required an all weld metal sample to show a tensile strength of 55,000 pounds per square inch, elongation in 2 inches of 20 per cent, and specific gravity of 7.8. Also, a free bend test was required to show 30 per cent elongation in

(*Please turn to Page* 68)



Stress relieving welds in a section of the 20-foot penstock by means of electric heating elements. After being heated to the proper temperature, joints were allowed to cool uniformly with heating elements and insulating blankets in place

Physical Appearance of Slag Indicates Quality of Steel

BY EARL C. SMITH
Chief Metallurgist, Republic Steel Corp.

PHYSICAL appearance of slag has been used for many years, both here and abroad, to guide the steel melter in handling the open-hearth furnace. Good descriptions of the appearance have been presented by several writers. The study by Janitzky reveals much of the pertinent information, and the recent study by Back is quite comprehensive. It will become a very useful addition to the existing method and is hardly more complicated than the blast furnace slag test which is very old. Continued observation will establish this additional method of control in a practical way where the melter foreman will consider it equal in importance with his metal test.

To develop more information concerning the factors involved, some hundreds of slag tests, sampled much after the methods described by earlier authors, were sectioned for study. Additional studies using reflected light are under way. Reflected light, while simpler in specimen preparation, does not offer the startling contrasts presented when color is permitted to aid. Due, however, to the very lare areas easily prepared, it probably will be the useful method in the longer time studies.

Structure Factors Need Study

We know from study of slag samples that we are not working with homogeneous liquid phases. We can see and feel the lumps of uncombined material. Any method of sampling will produce unalterable evidence of partial equilibrium in the way of partially combined products. Therefore, we are discussing a dangerous subject, which best can be approached on the basis of personal observation of the facts, the explanation of which lies in the future.

We encounter some very characteristic slag structures in our study. We encounter similar structures from such widely varying operation that it is reasonable to assume that these structures associate with some very definite conditions. The laws governing these occurrences are either not known or at least not widely published.

Acid open-hearth slag essentially is the product of oxidation of the metal itself, and we find ourselves in basic melting with the melt-down slags of nearly the same character as the acid slags. They are nearly clear, usually having a greenish cast on the splintered edges. They are acicular and apparently but two phases when chilled. They are high enough in basic components to be out of the acid class, but due to their high ability to dissolve iron oxide and render it inert they are very inactive slags.

Characteristics of Early Slags

Basic melt down slag, which is nearly a single phase, gives way to a multiple phase structure. The usual character is a black slag carrying certain white particles. The rounded shapes are similar to those encountered when combination is taking place by solution of a material which has a very limited ability to absorb the dissolving medium. To date, there is little definitely known of the character of the black, previously liquid areas. The white material corresponds to the lime silicate 2 CaO SiO_2. What may be dissolved in it is still the subject of speculation. It is known from the unpublished work of A. T. Cape that phosphorus compounds dissolve in dicalcium silicates, causing it to become stable in cooling. The work of Bowen and associates shows that, at steel working temperatures, it has a high solubility for lime iron compounds. It is of interest to study the very large floating lumps in a slag to theorize on the genesis of this form of lime silicate.

As we sample the early slags we find these lumps floating in the liquid. These may be so large as to weigh several pounds. They are covered with a characteristic shell which in the section looks almost white with a blocky appearance. This shell is 2 CaO SiO_2, carrying with it an unknown amount of dissolved materials. Toward the center of the lump the white gives way to a honey yellow material which seems to fill the interstitial space of the 2 CaO SiO_2. As we progress further we note the yellow darkens to a brown. The structure at higher magnification appears to be a series of veins of yellow into the white grains which are edged with brown. In rare cases in basic open-hearth work the brown is associated with a deep red material.

A probable explanation of the decomposition of a floater lump of lime is of interest. The contact of the slag, which in the early stages is nearly the oxidation product of the metal itself, provides a large amount of very liquid silicates which soak the colder, partially or completely burnt lime. Combination takes place at the very low temperatures of the early stages. The lime, having a very high affinity for silica, extracts from the molten silicates enough to form 2 CaO SiO_2, which is extremely infusible. It is a material with but a limited solubility for the other metallic oxides. The result is the formation of fingers of 2 CaO SiO_2 surrounded by the combined iron manganese lime solution. As long as an excess of silicate is present this reaction can proceed with the commercial result of an increasingly infusible slag. When the silicate of this mixture is combined there remains an excess of metallic oxides and lime to form additional calcium ferrites. These are low melting point materials, not particularly stable, having a very active nature.

Type Slag Sections Selected

It is of interest to follow the changes of slag from the melt-down to the extreme stage encountered when making very low carbon, low manganese material, for varied use. The series is best portrayed by selecting type slag sections rather than those from a single heat of steel. The shading of process from one grade of material to another is definite but not pronounced. By selection of type sections from several heats a sort of standard set has been collected.

In the early slags an acicular structure is the most commonly en-

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STUDIES of slag under a powerful illuminated microscope are said to tell the story of what is going on in the open-hearth furnace more accurately, more rapidly and more reliably than lengthy chemical analyses. This new practice, termed petrography or rock picturing, was described by Earl C. Smith, chief metallurgist, Republic Steel Corp., Youngstown, O., in presenting the Howe memorial lecture before the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 20. The title of this lecture was "Some Problems of Steel Melting."

Excerpts of this lecture, appearing herewith, describe various types of slags as revealed by the method and interpret their relationship to the steelmaking process. Mr. Smith pointed out that if the slag is watched, the steel will take care of itself. At certain Republic plants, the study of petrographs has enabled operators to increase production 2 to 3 per cent and get consistently uniform steel. In one case, the yield of an open-hearth furnace was increased from 72 to 85 per cent.

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countered appearance. Usually two phases are present. In rare cases the black green phase is present in but limited amounts and the slag may be nearly white. In the normal operation of the furnace an increasing amount of fluxing material in the way of lime is brought into the slag. The decomposition is slow and is marked by the disappearance of the acicular structure. The mass becomes a series of particles of $2CaO\ SiO_2$ coverings of the floaters surrounded by a black brown slag mass which shows the lacy radial structure of the breakdown stage. The floater lumps encountered at this stage may be small enough to show an entire lump in section.

What Slag Appearance Denotes

Such a slag is not active enough to make time in soft steel and represents the raw slag of the furnace operator's descriptive distinctions. Where the raw materials are low enough in sulphur and phosphorus such a slag goes about as far as is required in simple steelmaking. If, however, the plant requires a product which meets other dictates than proper carbon and to be hot enough to pour, it becomes necessary to carry the operation further.

If the operation is to be carried further, a rather important decision is in order. If a low oxidized heat is required the operator proceeds from this point cautiously. The heat is melted clear, all lime up, so that a known basicity is present. If the slag is too sticky the operation of cutting up may be by heat, spar, or additions of ore and burnt lime. If the heat is for a type of steel demanding high oxidation, and the slag is not basic enough, the operator proceeds to add lime after lime is up.

The addition of lime causes the formation of lime-iron compounds, which dissolve the $2CaO\ SiO_2$. The result is a definite change of color; the yellow-brown gives way to a red-brown; in the low metalloid heats the usual slag is a black-red.

Study of a series of these slags shows that the change of color is essentially the appearance of a slag with much clear $2CaO\ SiO_2$ in one case, and no primary $2CaO\ SiO_2$ in the other case. The probable compounds involved are $CaO\ Fe_2O_3$ and $2CaO\ Fe_2O_3$ which are described by Boike-Eitel.

Killed steels of the low oxidation type are made under slags of the yellow-brown cast in section; rimmed steels under those starting to show red-brown in section. Low metalloid types are usually distinctly black-red in cast when sectioned.

Occasionally an excess of lime is present due to low silica in the system and the basic material present is too high to permit of forming $2CaO\ SiO_2$. In such cases $3CaO\ SiO_2$ is present in long needles resulting from the sectioning of the flat tabular crystals in which it occurs. Such slags show quite often the effect of the very basic conditions in the needles of $CaO\ Fe_2O_3$, which are deep red. Probably the black-red cast of the low metalloid slag is due to this same deep red in finely dispersed condition.

Identification of Structures Needed

As the practical application of the study of these structures progresses, positive identification of them will result. This problem now is being worked upon in several laboratories. It represents a major problem of melting control, and best may be cleared up by the mineralogists of our universities, working with carefully made artificial mineral specimens.

We are face to face with the following problems: Our bottoms combine with our slag in the basic furnaces, and with the metal in the acid furnaces. So long as we work on an unknown bottom we may anticipate critical problems in our melting equilibrium. We need a pyroplastic material which is inert to slag and the metals melted within it.

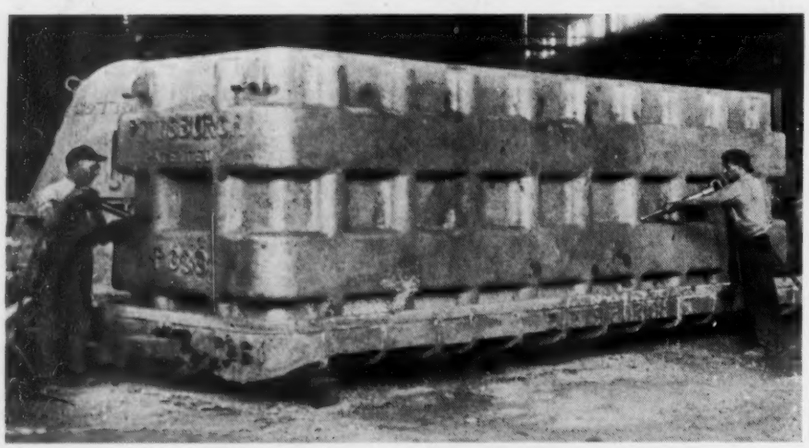
Higher Temperatures Desirable

Our roof and wall material is barely safe at our present operating temperatures. Studies and our practical experience indicate that our sulphur problems would minimize if we could safely use higher temperatures. We could use construction material insensitive to heat shock and capable of handling 3500 degrees Fahr.

We know that the working conditions we are studying hover around 3000 degrees Fahr. steadily, and we know little of the relation of the mass within the furnace, which is a liquid with an intermixture of solids, to the specimen which we investigate by chemical or other means of analysis remote from its natural environment. Thermal, chemical and mineralogical studies will clear up much of the lack of information. If we could with certainty sample the slags and know that our results paralleled the heat or the action within the furnace we would be far along our way. Comparative results indicate that most of the methods of sampling are satisfactory for the microscopic study of the insoluble phases.

There are very definite problems involved in sampling for chemical analysis. Whether the trend of the future will be toward physical mineralogical studies or quantitative and physical chemistry depends upon which method is best served by the samples obtained.

Large Tin Plate Annealing Box



In its issue of Nov. 12, 1934, STEEL presented the above illustration of a new type annealing box combining a rolled steel plate roof with cast side walls. The accompanying text should have stated that the annealing box was made in accordance with a design developed through the combined efforts of the engineering force and officers of the Pittsburgh Steel Foundry Corp., Glassport, Pa.

Builds Continuous Mills For English Companies

A 19-stand double strand rod mill complete with furnaces and finishing department now is being built by Guest, Keen, Nettlefolds Co., Newport, England. The mill, which comprises 14, 12 and 10-inch roll stands, is expected to be ready for operation about March.

Guest Keen Baldwins Ltd., Cardiff, Wales, is installing a 6-stand 21-inch continuous sheet bar and billet mill which is expected to be ready for scheduling about June.

Both mills were designed by the Morgan Construction Co., Worcester, Mass. which also is engaged in remodeling a rod mill for Templeborough Rolling Mills Ltd., Sheffield, England. Improvements include new 10-inch finishing stands, reels and handling equipment.

METHODS AND MATERIALS

Study Protective Value of Platings

A COMPREHENSIVE investigation of the protective value of nickel and chromium plating on steel conducted recently by research workers of the national bureau of standards, Washington, resulted in a number of interesting conclusions. The protective value of nickel coatings depends almost entirely on their thickness; at least 0.0005-inch is required for good protection under mild conditions, and at least 0.001-inch for severe conditions. The conditions of nickel deposition and of the cleaning and pickling have no marked effects on the protective value.

Presence of a layer of copper reduces the protective value of thin nickel deposits under all conditions, and of thick deposits under severe conditions. If chromium also is present, the copper has very little harmful effect in thick deposits. If the copper layer is buffed, the protective value of the composite coating is increased.

A very thin deposit of chromium, such as 0.00001-inch, sometimes reduces the protective value, especially of pure nickel deposits. Chromium coatings about 0.00002 to 0.00003-inch thick add very little to the protective value, but maintain their bright appearance owing to their resistance to tarnish. Relatively thick chromium coatings, from 0.00005 to 0.0001-inch thick, improve the protection against corrosion, especially in an industrial atmosphere.

The protective value of chromium over nickel or composite coatings is somewhat improved by using a bath with a high ratio, (g/1 CrO_3)/(g/1 SO_4), such as 200. Deposits produced at 95 degrees Fahr. are slightly superior to those made at somewhat higher temperatures.

Use of zinc under nickel makes the portective value less than that of either metal alone. Cadmium has very little effect under nickel. The use of zinc or cadmium under nickel tends to produce white stains and blisters.

S S S

Cast Iron Uses Chromium

A recently developed chromium cast iron contains from 20 to 30 per cent chromium, and is used for resistance to heat and corrosion. When present in that amount, chromium imparts a protective coating which is resistant to vapors containing sulphur and weak acids.

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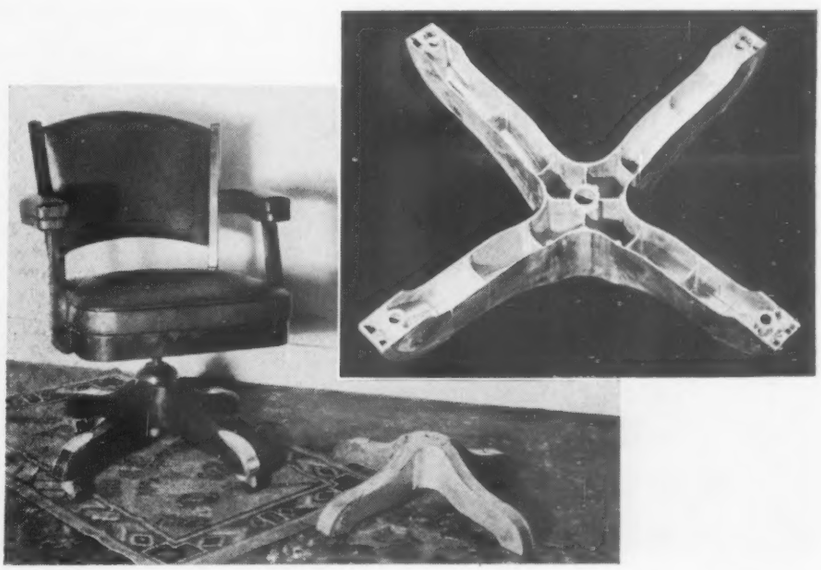
Oil Quenching Baths Must Have Adequate Cooling

In the quencing of steel parts, an eastern manufacturer was using a continuous oil quenching system of apparently ample capacity, but it was noted that during the course of each day the temperature of the bath gradually increased and the hardness of the quenched steel gradually decreased. It was obvious that even with ample capacity of oil in the quenching bath the tank was not provided with suffi-

New Die-Cast Swivel Chair Base



This spider base for a swivel chair is a fine example of design and appearance values obtained in die castings. Precision of the work is evidenced by the sharply defined surfaces of the kick plates and the depressed panels on the visible surfaces. Making this part in this way, says the manufacturer, Doehler Die Casting Co., Toledo, O., also is economical, affording a saving of metal. The base is of silicon aluminum alloy and weighs 5 pounds 2 ounces. The walls are thin, 7/64-inch, and the inset shows the design of the rib reinforcements

cient radiation capacity to release as much heat as was absorbed during quenching over an extended period of operation. A situation of this kind can be corrected readily by the installation of brine or cooling water coils directly in the quenching bath or immediately in contact with the outer surface of the bath.

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New Network Cables Meet Varying Requirements

Two new network cables, one a leaded-type cable for use in ducts and the other a nonmetallic cable for 600-volt service, have been made available by the General Electric Co., Schenectady, N. Y.

In the leaded-type cable, a layer of glyptal treated cloth covers the conductor and two layers of asbestos cover the glyptal cloth. Both the cloth and the asbestos are treated with pyranol and the whole is enclosed in a lead sheath. The glyptal resin has a unique molecular structure that makes it a good base for insulating compounds that must be tough, resilient, elastic, tenacious, and not readily decomposed. Pyranol is a liquid dielectric which is noninflammable, will not give off explosive gases, and possesses high dielectric strength.

The new nonmetallic cable for 600-volt service features a glyptal compound sheath and a rubber compound insulation which is highly moisture-resistant. The properties of the glyptal sheath make this cable suitable for use in oily or alkaline locations where protection against abrasion is not necessary; and because of the low water-absorption factor of the rubber compound used for the insulation, the new cable can be used in ducts or buried directly in the ground. When furnished with a treated-braid reenforcement, it can be used as a portable cable.

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Cast Iron for Brake Drums

One of the promising applications for centrifugally cast nitrided nitricast iron is for the wearing surfaces of truck and bus brake drums. Automotive manufacturers already have displayed interest in this material for this purpose.

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Cadmiun Plating Tried To Eliminate Tool Sparking

Steel tools, when sharply striking flinty surfaces, give off sparks which become fire hazards, especially in the presence of flammable vapors. Several of the leading oil refineries have been troubled with sparking for some time and are trying cadmium plating on tools as a possible solution to the problem. The final outcome of the tests has not yet been determined.

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Sulphur Is in Suspension In New Cutting Fluid

Commercial production of the new sulphurized cutting fluid known as Sulflo has been undertaken by the Sulflo Corp. of America, 15 Princeton street, East Orange, N. J. This fluid, described in STEEL of Dec. 17, was developed by the Thomas & Hochwalt Laboratories Inc., Dayton, O. It is a stable suspension of finely divided sulphur in petroleum oil or other liquid vehicles; in other words, the sulphur is in suspension rather than in solution. The use of this fluid is said to permit higher cutting speeds and to result in greater life of cutting tools and improved finishes in the product. Officers of the Sulflo Corp. of America are: President, Howard Coffin; executive vice president, A. H. Ballard; chief engineer, Victor R. Abrams.

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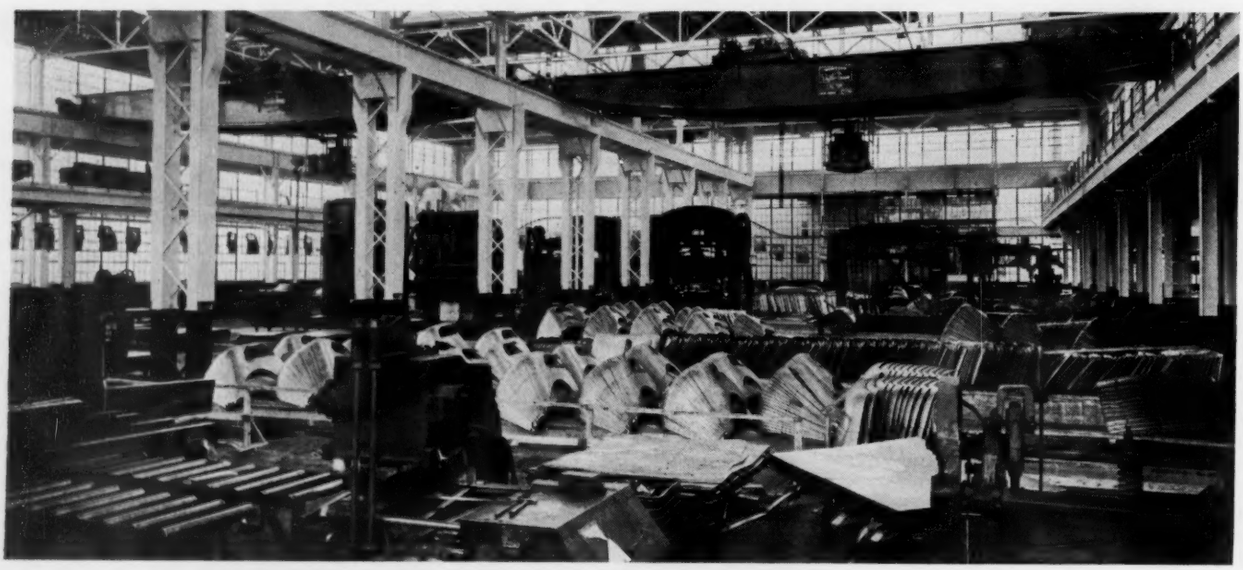
Develops Self Hardening Arc Welding Electrode

A new hard surfacing electrode, for building up straight carbon steel, low alloy or high manganese steel surfaces to resist abrasion, is announced by the Lincoln Electric Co.,

Cranes Handle Dies and Materials



OVERHEAD TRAVELING CRANES SOLVE HANDLING PROBLEMS IN AUTOMOBILE BODY PLANT: For handling dies to presses, and for handling material, the new automobile body plant of Briggs Mfg. Co., Detroit, has been equipped with two overhead traveling cranes supplied by Whiting Corp., Harvey, Ill. They were installed and in operation before the building was completed and were used in placing the machinery. Each crane has a main hoist of 30-ton capacity and an auxiliary of 10-ton capacity; they have span of 75 feet 6 inches and in each case the operator's cab is placed at center of bridge to give the best view of the floor. Speed of bridge travel is 20 feet per minute while speed of the trolleys is 100 feet per minute. These cranes are equipped with speed reducer drive with herringbone gears, completely enclosed and operating in oil, roller bearings and other latest design features

Cleveland. Known as "Abrasoweld," this electrode is expected to prove particularly useful for such applications as restoring teeth, lips and bottoms of power shovels; lugs and treads of tractors; housings and impellers of centrifugal sand pumps; rock crushing equipment; agricultural machinery; gear and pinion teeth.

Deposit Hardens in Service

According to the manufacturer, the electrode provides a deposit of abrasion-resisting alloy of the self-hardening type which surface hardens rapidly under conditions of impact and abrasion; there is no tendency for the deposit to chip off in service. The deposit develops its maximum hardness only at the surface where it is cold worked and this leaves a strong core for resisting shock. In this respect, the deposit is similar to high manganese steel, the difference being that the metal is harder as deposited and increases in hardness more rapidly. For example, it is claimed that moderate peening will increase hardness from 20-30 Rockwell C as deposited to approximately 50 Rockwell C. The weld metal must be ground to shape as it cannot be filed or machined.

It is said that the deposit is more resistant to corrosion than high manganese steel and it can be forged hot without materially altering its physical properties. In a recent test, teeth on a drag scraper built up with the metal showed superior service life. The electrode is made in $\frac{3}{16}$-inch size 14 inches in length and is used with reversed polarity with a current range of 125-200 amperes and 24-27 arc volts.

Many and Diversified Uses for Carbide Residue in Industry and Elsewhere

CARBIDE residue is a material which may be put to many uses. This subject is one of interest to the steel producing and metalworking industries generally in view of the fact that thousands of acetylene generators of various sizes, employed in connection with oxyacetylene welding and cutting, are producing large quantities of carbide residue. Following are excerpts from an article on this subject appearing in the March issue of *Oxy-Acetylene Tips*, published by Linde Air Products Co., New York.

Calcium carbide, brought into contact with water, forms acetylene and calcium oxide. This immediately forms calcium hydrate or hydrated lime by slaking in the water in the generator. Calcium carbide residue, as it leaves the acetylene generator, is wet calcium hydrate, or wet hydrated lime. On a dry basis it is higher in calcium than most hydrated limes on the market, because in making calcium carbide for the generation of acetylene only the best grade of high calcium lime is used. Its composition is constantly checked by chemical analysis.

Lime Completely Slacked

The residue from an acetylene generating plant has a number of advantages which make it particularly desirable for use as high grade hydrated lime. Because it is made in many times its own weight of water, carbide lime is totally free from unslaked lime. It also has a fine state of sub-division or fineness. Tests of dried carbide residue show that 99.9 per cent of it will pass through a 300-mesh sieve. This extreme fineness is caused by the nature of its formation. The acetylene on liberation in the generator has a tendency to crack or break open the ordinary fine grains of the lime into still finer particles. The heat of generation and the excess water in the generator also present ideal conditions for the production of very fine particles of hydrated lime.

Sets Quickly and Hardens

The outstanding advantage of this fine state of subdivision is a quicker and more efficient action when carbide residue is used in making mortar or plaster. A smaller amount of lime is required when residue is used in making mortar because the residue cements the particles of sand together with a thinner coat. This gives a quicker and harder set. This minute subdivision is also particularly valuable when carbide residue is used in the chemical field. Low magnesium and high calcium are especially necessary in many chemical uses of lime. There is only a trace of magnesium present in carbide lime, because the lime originally used in making calcium carbide must be extremely low in magnesium.

Users of acetylene generators will find that, for many purposes, it is much more economical to make use of their carbide residue than to purchase slaked lime ready made.

Hoist brakes, when they become slick, slippery, or sticky and catch too quickly, as they often do, can be sprinkled with a little carbide residue. This will remove the cause by absorbing the oil and grease, making a friction that will hold the load and not stop the cage, skip or bucket, with a jerk when the brake is applied. When the clutch slips and will not pull the load, carbide residue will cure it as well as it does the brakes; that is provided the clutch is not too loose.

A little carbide residue scattered on the floors of plants under bearings, in engine pits and similar foundations, will soak up any oil and make it a very easy matter to sweep the floor more easily and effectively than by wiping up the oil with waste. When cleaning and overhauling old machinery which is rusted, carbide residue mixed with water or oil will remove the old grease, oil and rust with very little labor. In fact, polishing all kinds of bright metal is made much easier by the use of carbide residue mixed with a little water or oil.

Lime Water Has a Use

The water drawn off from a carbide residue settling pit or tank has been found of value in purifying drainage pipes, traps of sinks and miscellaneous pipes and channels of this class.

A splendid boiler lagging can be made by the following formula and applied direct to the boiler with a trowel, or molded into sections or blocks of suitable size and then dried and applied in the form of the usual sectional lagging:

(1)—200 pounds carbide residue, drained to a soft putty consistency; (2)—100 pounds asbestos fiber or asbestos fiber and magnesia (Old lagging properly ground will be satisfactory); (3)—50 pounds fine dry pine sawdust. Mix (2) and (3); then add (1) and mix thoroughly. If too dry add a small quantity of water. If oak or wet sawdust is used, quantity should be increased in the same proportion as the difference in weight per cubic foot.

It has also been found that carbide residue mixed with equal parts of Fuller's earth will produce a good heat insulator for small furnaces.

Unspent calcium carbide has come into quite common use for the quick thawing of ice which encumbers railroad frogs and switches, fire hydrants and similar equipment, and car wheels frozen to the rails. In most cases the heat of generation suffices to accomplish the desired purpose. If the gas is ignited to hasten the thawing, care should of course be exercised to avoid the possibility of igniting nearby materials.

Carbide residue has many uses in agriculture, such as in whitewash, spraying solutions, insecticides. It may be used to advantage in giving good tilth to soil. It also is used in correcting soil acidity. It is used in lieu of lime in making mortar. It is considered one of the best water-tightening media for use in concrete.

Forming, Welding, Finishing Blown-Up Steel Trademarks

By H. B. Lewis
Smoot-Holman Co., Inglewood, Calif.

IN BUILDING the porcelain enameled eagles for the Richfield Oil Co. of California, detail drawings of frame and complete assembly were made from the plaster cast, approximately 18 inches high, supplied by the purchaser. In detailing, some conventionalizing of the design was done because the designer had intended that the feathers be modeled in the wings and that the finished product, in a single color, should show its modeling in lights and shadows. It was our suggestion that relatively flat surfaces be used and the detail brought out by the use of permanent color markings—a treatment entirely feasible in porcelain enamel.

Full size paper patterns were then developed for all the major parts, using plane curves exclusively so that no drawing of the metal was required except in rounding the edges of sheets before welding to avoid sharp corners.

The sheets were cut on a rotary shear where the curves permitted and finished with hand snips. The edges were turned to form slightly rounded corners by hand as no equipment is available, to our knowledge, to do this on irregular curved edges.

Method of Assembly

After the cutting and forming, parts such as the head, the feet and the leading edges of the wings were gas welded into subassemblies before enameling and then assembled on the frame in the black by means of Parker-Kalon screws and lead washers. The minor parts then were cut and fitted in place. The wing sheets were enameled flat and sprung to the desired curve in the final assembly.

In building the four 9-foot eagles, a jig was made for the entire frame on a huge base plate kept for such work and the entire frame jigged and arc welded at once. Templets were made for all the sheet metal parts as the first one was assembled and the final three were interchangeable in all their parts. Stencils for the markings were made and indexed to screw holes, so that lines were accurately matched across final assembly joints.

The accompanying illustration taken at the back door of our press department, shows the joint lines and screws clearly. It should be noted that the bird was mounted on a tower high enough so that these mechanical details are not discernible from the street. The head and neck form a subunit nearly 4 feet long, flanged inwardly and bolted to a structural frame ring just back of the boundary line between the light neck and dark body.

AN ILLUSTRATED article "Blown-Up Trademarks Create Business For Steel Fabricating Shops" which appeared on page 48 of STEEL *of Sept. 24, 1934, described the blown-up eagles fabricated by Smoot-Holman Co., Inglewood, Calif., and installed on towers surmounting new filling stations of the Richfield Oil Co. of California.*

For the following further comments on fabrication of these steel eagles, the editors are indebted to H. B. Lewis, Smoot-Holman Co.

Obviously it would not be practicable to weld the entire bird into one unit and balance it complete. At the enameling temperatures, 1650 to 1850 degrees Fahr., the sheets are soft enough to sag unless well supported and of course all supports must be on the unexposed surface of the sheet. In addition, all parts of the structure must heat and cool at very nearly the same rate or the enamel will be unevenly fired. This precludes the possibility of enameling any assembled structure composed of structural shapes and sheets.

Oxyacetylene Welding Used

We use both arc and gas welding but find the oxyacetylene torch much the better for most of our work. It is slower than the arc but requires much less grinding after welding to finish the joint for enameling. The balance would probably swing to favor the arc on heavier gages of steel, but most enamel work is on No. 18 gage or lighter.

Our furnaces are natural gas and oil (optional) fired, of the intermittent box type, that is, combustion takes place in the work space while the work is being loaded on the fork and the fire shut off when the loading door is opened. The fire stays off during the baking or burning period, the work being heated by radiation from the brick-work.

It is really surprising that so realistic a final result could be achieved without elaborate hand hammered or die formed shapes.

BLOWN-UP eagle, formed from steel sheets, assembled by means of sheet metal drive screws, gas welded and porcelain enameled

A.S.T.M. Work Advances at Group Committee Meetings

STANDARDIZATION and research work of the American Society for Testing Materials was advanced measurably through the group meetings of the society's committees in Philadelphia, March 4-8. In all, about 130 meetings of main committees, sections and subcommittees were held, and most of these were unusually well attended. Total registration for the week was 610, a figure which reflects increasing interest in the society's specifications and research programs.

A large number of proposed standards were offered by the committees and several specifications and test methods which have been in the tentative stage were recommended for adoption as standard. Several new committees will be organized as a result of actions taken by the standing groups in order to undertake research or other work to develop adequate data on which to base needed specification requirements.

Paint Symposium Is Held

In conjunction with the group meetings of committees, the society held its 1935 regional meeting on March 6, this taking the form of a symposium on paints and paint materials. This symposium was arranged under sponsorship of committee D-1 on preservative coatings and embraced 15 papers prepared to be of interest to both consumers and producers.

Subjects discussed included the preparation and use of specifications; coatings for passenger car equipment; paint, varnish and lacquer testing; drying oils; zinc, lead titanium and mineral pigments; chemical colors; natural and synthetic resins; lacquer solvents and volatile thinners; and turpentine and petroleum distillates as thinners for varnish and paint.

Included in the committees participating in the group meeting program were a number dealing with iron and steel and nonferrous metals. The work accomplished by these committees is summarized as follows:

Committee A-1 on Steel

Specifications covering open-hearth carbon-steel rails (A 1-30) are to be revised to include details of drop testing equipment and definite descriptive revisions. Changes will be incorporated in the standard A 49-21, covering quenched high-carbon steel splice bars, to bring the chemical and physical properties in conformity with railroad specifications.

The subcommittee on structural steel reported progress in developing requirements for high-strength rivet steel for use with structural silicon steel and revision of specifications covering structural nickel steel. A proposed draft of a recommended practice covering conditioning of rolled steel surfaces of structural steel by welding was discussed and with revisions probably will be reported at the next meeting in Detroit.

It was recommended that the tentative specifications for heat-treated steel elliptical springs (A 147-33 T) be advanced to standard. Changes are contemplated in the requirements for chromium content in specifications for chrome-vanadium steel bars for railway springs (A 60-27).

A proposed specification covering axle steel concrete reinforcement bars was approved with a request that it be issued as a 1935 tentative standard. The requirements cover two classes of bars, plain and deformed, in three grades, structural steel, intermediate and hard. Bars are to be rolled from carbon-steel axles for cars and locomotive tenders. No other material is to be used. Carbon determination of each axle is to be made by the manufacturer. Tensile properties provide, for the plain bars, 55,000-70,000 pounds per square inch tensile strength in structural grade; 70,000-90,000 intermediate grade; 80,000 minimum, hard grade. Tensile requirements for deformed bars are the same, respectively. Yield points are 33,000 pounds per square inch, 40,000 and 50,000 for the three grades. Provisions require one tension and one bend test from each lot of ten tons or less of each size of bar rolled from each lot of axles sorted in groups as covered in the specifications.

Attention to Casting Specifications

Criticism was raised on certain requirements in the tentative specifications for carbon-steel castings for industrial, railroad and marine uses (A 154-33 T) which it was thought would eventually replace the standard specifications for carbon-steel castings (A 27-24) and for carbon-steel castings for railroads (A 87-27). It was decided to recommend the withdrawal of A 154, standards A 27 and A 87 being still in effect; a subcommittee will prepare specifications to cover separately different grades of carbon-steel castings, including castings made of steel suitable for welded structures.

Subcommittee IX recommended that proposed specifications covering carbon-steel still tubes for refinery service be published as tentative. A number of revisions consisting of additions to the range of sizes and gages up to and including 10 inch outside diameter and the deletion of sizes over 10 inches outside diameter were asked in the tables of the specifications for lap-welded and seamless steel and lap-welded iron boiler tubes (A 83-34). A proposal to substitute manufacturing weights for present theoretical weights was considered but the revised tables will continue to carry theoretical weights as heretofore. Clarification of marking requirements in this same specification was approved.

Specification requirements are to be drafted covering electric-resistance welded boiler tubing.

Formation of a new standing committee to cover chemical analysis of metals was approved.

Important revisions in the standard specifications for commercial quality hot-rolled bar steels (A 107-33) and commercial cold-finished bar steels and cold-finished shafting (A 108-33) involve the revision of S.A.E. grades and the classification of flat hot-rolled steel. The recommendations provide for adoption of carbon steel and free cutting steel compositions soon to be announced by the S.A.E., with the retention of S.A.E. grade numbers.

The subcommittee on welding recommended that specifications for high-tensile strength carbon steel plates, A 149 and A 150, be included in the list of steels suitable for welding. A preliminary study of the effect of carbon and manganese content on weldability showed the need for an extensive test program.

Committee A-3 on Cast Iron

Revisions are being recommended in tentative specifications for gray iron castings (A 48-32 T). The separately cast tensile bar will be eliminated since tests have shown that tensile bars cut from the transverse test bars are satisfactory. Transverse test values will be revised.

A proposed tentative specification for automotive gray iron castings has been developed with co-operation of the iron and steel division, Society of Automotive Engineers.

Another activity involves necessary revisions in the existing specifications for cast-iron culvert pipe (A 142-34 T).

Committee A-5 on Corrosion of Iron and Steel

Withdrawal of tentative specifications for zinc-coated (galvanized) iron or steel farm-field and railroad, right-of-way wire fencing (A 116-32 T) and tentative specifications for zinc-coated (galvanized) iron or steel barb wire (A 121-32 T) was recommended. Standard specifications A 116 and A 121 are to be revised editorially to clarify requirements for weight and uniformity of coating.

Since adoption as standard of the standard methods of determining weight and uniformity of coating on zinc-coated (galvanized) iron or steel articles (A 90-33) has made obsolete the standard methods of testing zinc-coated (galvanized) iron and steel wire and wire products (A 110-30), the latter are recommended for withdrawal as A.S.T.M. standard.

Action was taken to recommend the adoption as standard of the existing tenative recommended practice for safeguarding against embrittlement of hot-galvanized structural steel products and procedure for detecting embrittlement (A 143-32T).

Subcommittee VII has completed a critical review of the Preece test for determining the uniformity of zinc coating on wire. It is planned to publish this method as a draft standard soon. Further work on the use of this test on irregularly shaped articles, such as hardware, is actively under way. Subcommittee VII also has under way a critical review of test methods for determining the weight or thickness of electro-deposited coatings and for determining the weight of zinc coatings on coated hardware.

Inspection data on field tests of bare and coated sheets and hardware will be published this year in substantially the same form as before, noting additional failures.

Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys

Progress was reported in the formulation of purchase specifications for the chromium and nickel-bearing steels. The committee expects to

present in June five new specifications which will cover the annealed corrosion-resistant sheet steels, both plain chromium and chromium-nickel steels and also for cold-rolled chromium-nickel steel.

Subcommittee on specifications for castings completed three new specifications for plain chromium-steel castings, also reported six additional specifications for steels containing chromium and nickel well under way.

The subcommittee on mechanical tests has prepared an extensive program for testing both annealed and cold-drawn nickel-chromium steel, especially the 18-8 chromium-nickel types, with a view to determining applicability of existing A.S.T.M. standard methods. The committee plans a co-operative test program to study methods of mechanical testing and their use for these types of steels.

The subcommittee on corrosion testing has been giving consideration to the possibility of undertaking atmospheric exposure tests of metals in the field of committee A-10 work. These would be carried on simultaneously with the laboratory tests using procedures developed, or being studied, by the subcommittee.

Committee on Methods of Metallographic Testing

Revised methods for preparing and examining specimens were carefully considered. The committee intends that these methods will replace obsolete ones now in existence since they are designed to present in convenient and condensed form procedures successfully used for both ferrous and nonferrous metals and alloys. The committee recommended publication of the methods as tentative.

The first section of the proposed standard covers selecting, mounting and cleaning of samples. This is followed by discussion of recommended procedures for examination of various metals and their alloys, including aluminum, copper, iron and steel, lead, magnesium, nickel, precious metals, tin, zinc, and finally recommendations covering microscopy and photography. In sections covering the various alloys the preparation of specimens is described, tables of etching solutions involving the reagent composition, method of use and application are given, followed by discussion of examination and identification of constituents.

Committee on Testing Thin Sheet Metals

The two problems which have occupied attention include studies of methods of hardness testing of very thin sheet metals and obtaining information as to the scope and usefulness of various mechanical tests. Identation hardness studies have resulted in recommendations respecting details of procedure in determining Rockwell hardness of thin sheet metallic materials and these were approved for submission to the committee on indentation hardness for inclusion in the existing A.S.T.M. tentative methods of rockwell hardness testing of metallic materials (E 18-33 T).

Information obtained from a questionnaire has indicated that various tests, including tension, several types of indentation hardness, cold bend, cupping, fatigue, shear or punching, impact, metallographic, creep, corrosion, embrittlement, etc., are now being used for determining the properties of sheet metals. A report is planned for the Detroit meeting.

Specifications for Electroplated Coatings

Work of the past three years under direction of the A.S.T.M., American Electro-Platers' society and national bureau of standards, has reached the state where specifications on the plated coatings on iron and steel are about ready for approval. It has been found that plating usually used is considerably less in thickness than should be required in accordance with the findings of the test.

It is expected that the three specifications will be issued shortly. These cover: Electrodeposited coatings of nickel and chromium on steel, electrodeposits of zinc on steel, and electrodeposits of cadmium on steel. In each, two types of coating are covered, namely, coating for general service and coating for mild service. The requirements involve manufacture, thickness of deposits and, in the case of nickel and chromium coatings on steel, a continuity test is specified. Methods for thickness measurement are given in each of the three specifications.

Committee on Fatigue of Metals

A progress report was made on the co-operative study with the X-ray committee on the effect of fatigue damage in metals on the indications given by X-ray crystal analysis. So far, results indicate that in some metals the X-ray spectrogram may indicate the effect of cold work, but that no clear evidence has been seen in the X-ray spectrogram of the starting of fatigue cracks.

The committee voted to prepare a set of notes on the technique of making fatigue tests on rotating-beam testing machines, including machines of the cantilever type.

A problem of the fatigue strength of steel-core copper-coated wires (copperweld) was presented, and suggestions made for the investigation of the problem.

Experiments on determining damage done to metal by occasional heavy overstress were reported, following the "damage line" method of H. J. French. This method gives promise of usefulness in the important problem of determining how sensitive a metal is to damage under occasional overload. This is, perhaps, fully as important as the problem of the strength of metal under ordinary working stresses.

New types of testing machines for fatigue testing were discussed, especially machines for testing wire.

Committee on Properties of Metals at Low Temperatures

This committee, newly organized, is to be a subcommittee of the joint committee on effect of temperature on properties of metals. For its work, the committee has defined low temperatures as any below room temperature, that is, 70 degrees Fahr. This subject is of great interest to many branches of industry, because of the subnormal temperatures at which equipment must work, such as railroad equipment in northern climates, airplanes flying at high altitudes, in the liquefaction of gases, dewaxing of oils, etc. The committee will send out immediately a questionnaire to elicit information on what test and research work has been done.

Sectional Committee on Specifications for Zinc Coating of Iron and Steel

The committee gave consideration to several existing specifications for zinc-coated materials and approved for submission to letter ballot of the committee the following A.S.T.M. specifications which, if approved, will be submitted to the American Standards association for approval as American tentative standards: Standard specifications for: Zinc-coated (galvanized) iron or steel telephone and telegraph line wire (A 111-33); zinc-coated (galvanzed) iron or steel tie wires (A 112-33); zinc-coated iron or steel chain-link fence fabric galvanized after weaving (A 117-33); zinc-coated (galvanized) iron or steel wire strand (cable) (A 122-33); and tentative specifications for black and hot-dipped zinc-coated (galvanized) welded and seamless steel pipe for ordinary uses (A 120-34 T).

Committee B-3 on Corrosion of Nonferrous Metals and Alloys

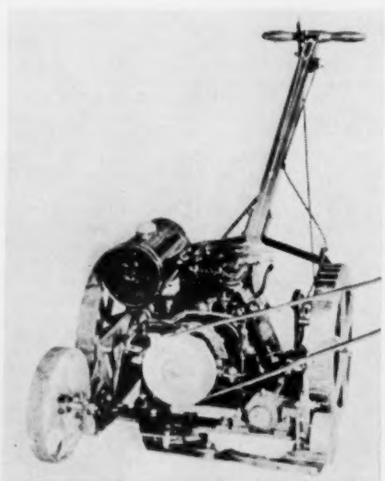
This committee received reports of subcommittees VI, VII and VIII, charged with responsibility of planning and carrying out tests in the atmosphere in various locations in the United States, and in different liquids. Plans were completed for displaying corroded specimens at the A.S.T.M. annual meeting in June. A series of atmospheric specimens exposed for one year, and another series which has been exposed for three years will be shown. The display also will include specimens immersed for various lengths of time in sulphuric acid pickle tanks, and an extensive series of galvanic couples exposed to atmosphere at nine locations in various parts of the country.

Committee B-5 on Copper and Copper Alloys

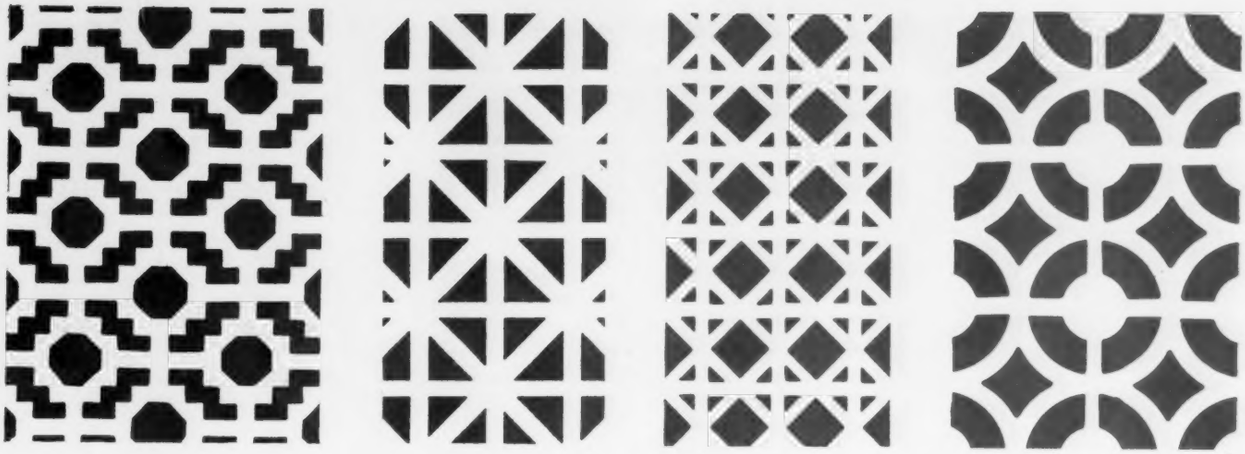
Three new tentative specifications were proposed and it is anticipated these may become 1935 tentative standards. The specifications cover wrought phosphor-bronze bearings and expansion plates for bridges and structures, and silicon-bronze bearings and plates for the same purpose. The third specification will provide standardized requirements for a copper-silicon alloy wire for general use.

Designs New Combination Gasoline Power Unit

A power lawn mower recently developed by the Clipper Mfg. Co., Dixon, Ill., and shown in the accompanying illustration, is designed so that the mower knives may be removed, thus making it possible to utilize the 1-horsepower gasoline motor for other power purposes. The machine is built with various steel parts including a terne plate gasoline tank, rods, springs, alloy steel mower knives, bolts and nuts, screws and rivets.



Combination power unit with mower removed



—*Illustrations courtesy of Wickwire Spencer Steel Co., New York*

Perforated metal sheets are available in a wide variety of patterns of which the four shown are typical. The pattern at the left is a development of American Indian design; the one at the left center is based on the familiar Union Jack; the one at the right center is based on the pattern of caning for chairs; and the one at the right is a development of the circle and cross peculiar to ancient civilization. All are reproduced two-thirds actual size

LARGE USES OF STEEL IN SMALL WAYS

282nd Article ◆ Perforated Metal Sheets

MANY new uses have been found for perforated metal sheets in the past few years. This product has become an important material for fabricating metal goods of many different kinds. It is used widely where interior parts are to be covered by a panel admitting of ventilation. A major use is for screening, sizing or grading materials or products. It also is employed where panels of reduced weight are desirable. In many cases it is used because of its pleasing appearance.

Uses of perforated metal sheets for decorative and ventilating purposes are legion. Some of the most important applications are in guards, display stands, radiator cabinets, stores, metal beds, heaters, humidifiers, baby carriages, ferneries, hampers, vegetable bins, baskets, chemical dispensers, medicine cabinets, lockers, door panels, electrical apparatus, radio cabinets, telephone cabinets and numerous decorative and ventilating devices.

Various Metals Are Perforated

Thousands of tons of steel sheets are consumed each year in the production of perforated sheets. Some 35 to 50 per cent of the tonnage is removed by the perforating presses and becomes scrap. The sheets customarily used are gages Nos. 20, 22 and 24. While plain carbon steel is the material most generally used for making decorative perforated metal sheets, bronze, brass and aluminum also are used to a considerable extent. Of late, stainless steel perforated sheets have been produced in some volume.

Some years ago the general trend toward improved design overtook perforated sheets and this tendency has been accelerated so that designs of great variety now are obtainable. Many of these have a highly artistic appearance. Because of the wide range of designs available, perforated metal may be blended harmoniously with any decorative scheme.

Artistic Patterns Are Designed

Some notable recent designs, covered by patent applications, are shown in the accompanying illustrations. One of them is based on the familiar Union Jack. Another is from American Indian design. Another is a development of the combination of the circle and the cross, peculiar to several ancient civilizations. Another is of the pattern used in the caning of chairs and follows the formula of maximum concealment with high degrees of free air opening for ventilation.

Practically all perforated steel sheets are given a coat of paint or lacquer or other finish treatment after fabrication into the products of which they become component parts. That means that they must be produced without surface defects which would mar the decorative finish. To get such results it is necessary that the perforations be cut cleanly, without any feather edges or other blemishes.

To insure clean perforations, it is necessary to build and maintain punches and dies with proper clearance as well as to use great care in the selection of the sheets. Automatic feeding press equipment likewise is necessary to guarantee constant uniformity of spacing of design.

Effect of Braking on Car Wheels To Be Tested

Plans are under way at Purdue university, West Lafayette, Ind., for a series of tests on car wheels used by American railroads to determine the amount of strain placed upon a wheel by the braking action. The tests, which will be under the direction of the department of railroad mechanical engineering, will start in a few weeks.

As a brake shoe is applied, the temperature of the wheel tread rises considerably more than the hub, causing an unequal expansion within the wheel. This unequal expansion causes a strain, weakens the wheel and, in some cases, causes the plate of the wheel to break. The tests, which are to be financed by the manufacturers of the wheels, will determine the type of wheel and the material best suited to resist braking stress. Cast iron, cast steel and wrought iron wheels will be included in the tests.

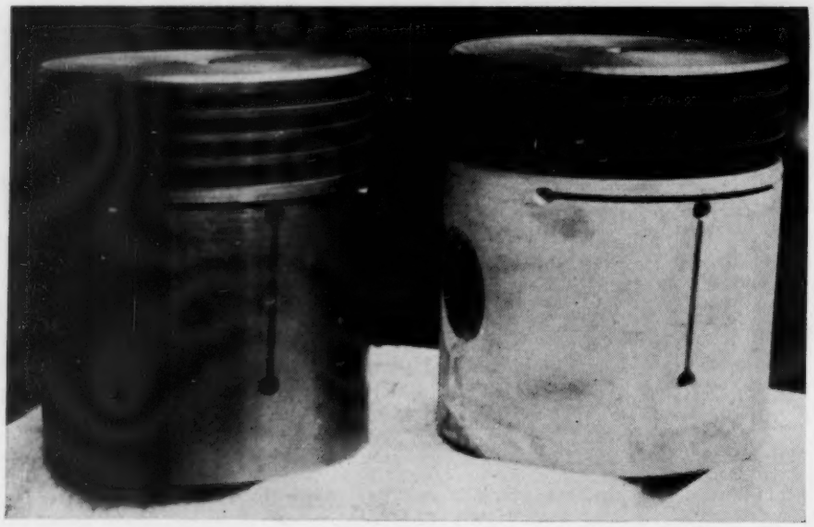


Fig. 1—The cast-iron piston at the left is finish machined and ready for tin plating. The piston at the left has had its skirt plated with tin to a thickness of 0.001-inch

Tin Plating of Pistons Is Held Under Close Control

BY FRED B. JACOBS

DATING from the time the first motor vehicles were put on the market commercially, one of the most serious factors confronting both the manufacturer and purchaser has been the initial wearing between the pistons and the cylinder walls. In the days of bored cylinders, the purchaser was cautioned not to exceed a speed of over 20 miles per hour for the first thousand miles. Otherwise scored cylinders and broken rings might, and often did, result. With the general adoption of ground cylinders and ground pistons, danger of scoring the cylinders was reduced. Later when the honing process for finishing cylinders was introduced the danger was still reduced, and the initial speed recommended was stepped up to 35 miles per hour.

Two wearing surfaces of like metal, cast iron on cast iron in the case of automotive engine cylinders, do not make an ideal wearing contact under all conditions, especially when the parts are new, for no matter how finely metal surfaces are finished by grinding or honing, such surfaces look like plowed fields when examined under a microscope of only moderate magnification, say 50 diameters. However, when the surfaces are worn in they appear much smoother and, if correctly lubricated, satisfactory performance can be expected.

To eliminate the difficulties due to initial wearing in of cast iron pistons and cylinder walls, the White Motor Co., Cleveland, is using the tin plating process whereby the wearing surface of the piston, that is the skirt, is electroplated with pure tin. This coating is 0.001-inch thick, or 0.002-inch on the diameter. While the process is simple in itself, it involves a number of factors which must be given careful attention in each step of the process to insure success.

Tin Skirt Only

Referring to Fig. 1, the cast iron piston at the left is as it comes from the production department. Its outer diameter has been finished by grinding and the ring grooves and piston pin hole are machined to the required dimensions. The piston at the right is as it comes from the plating process. It will be noted that the tin deposit is applied to the skirt only, that is, the ring grooves and lands and the piston pin hole are not plated.

The result shown in Fig. 1 is brought about automatically through the manner in which the parts are racked for plating. This is shown clearly in Fig. 2 which is a loaded rack accommodating eight pistons. The part of the rack which is immersed in the plating bath must be protected against the plating action

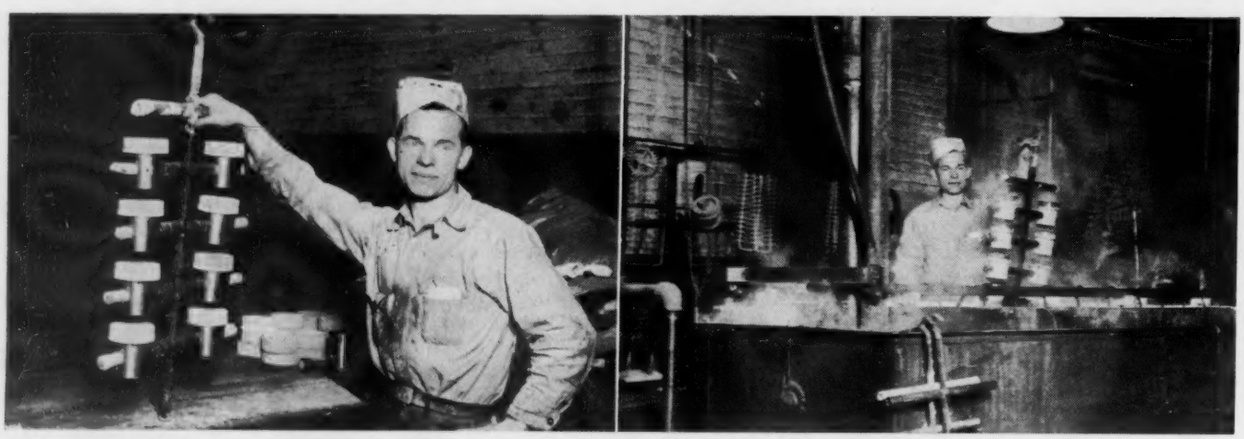
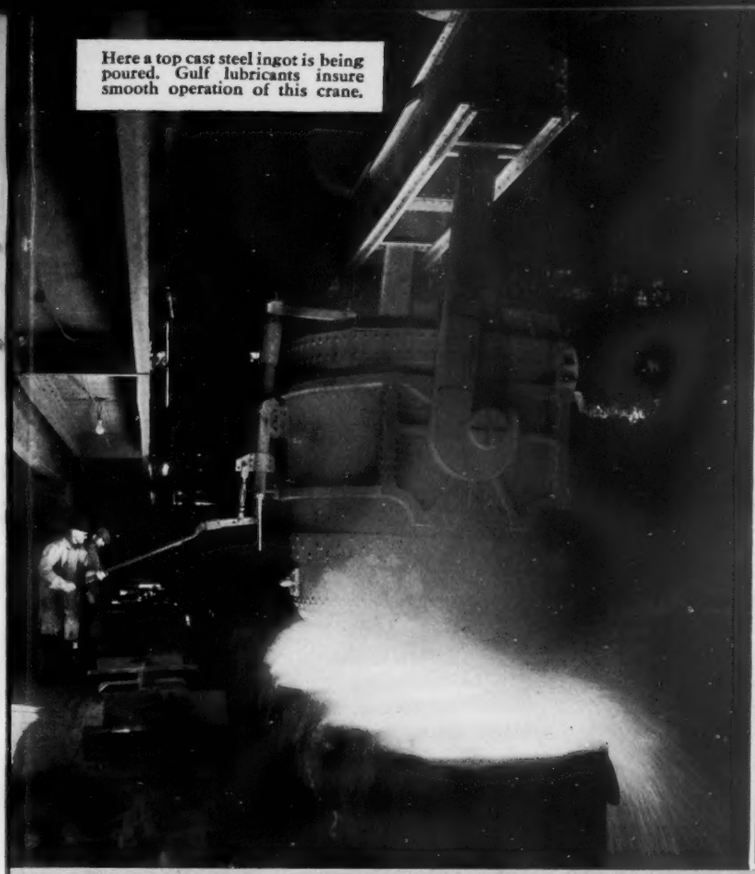
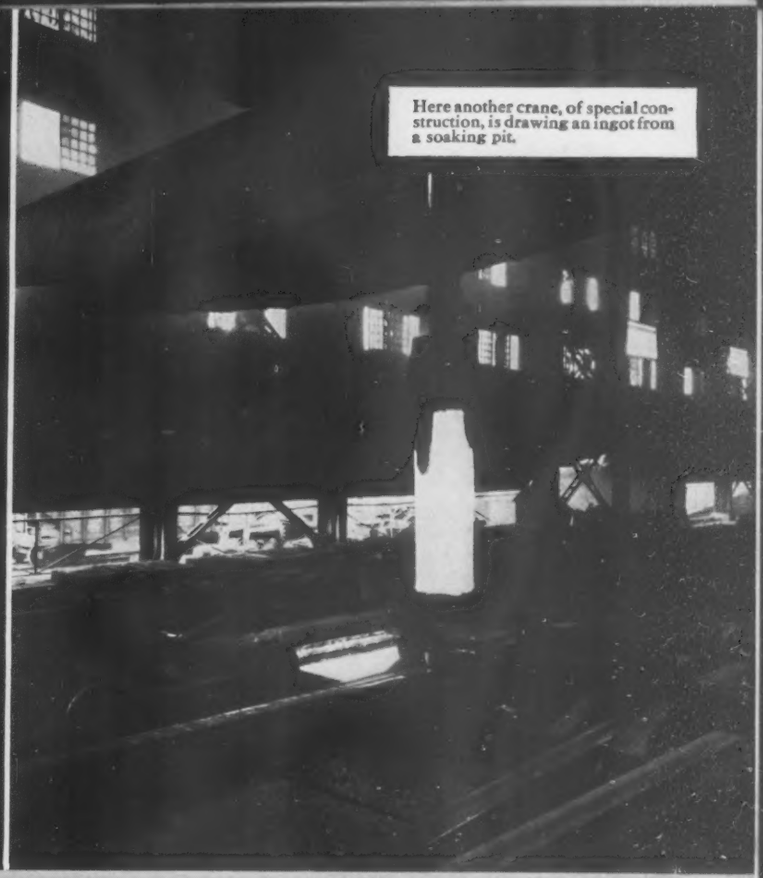


Fig. 2 (Left)—For plating, eight pistons are loaded on a rack as shown. Piston tops are covered with rubber-coated caps and outside piston pin holes are fitted with wood plugs. Electricians' tape protects exposed portions of the rack against plating. Fig. 3 (Right)—The plating tank sets inside a larger tank and is surrounded by water which is heated to maintain the plating bath at a temperature of 160 degrees Fahr.



Here a top cast steel ingot is being poured. Gulf lubricants insure smooth operation of this crane.



Here another crane, of special construction, is drawing an ingot from a soaking pit.

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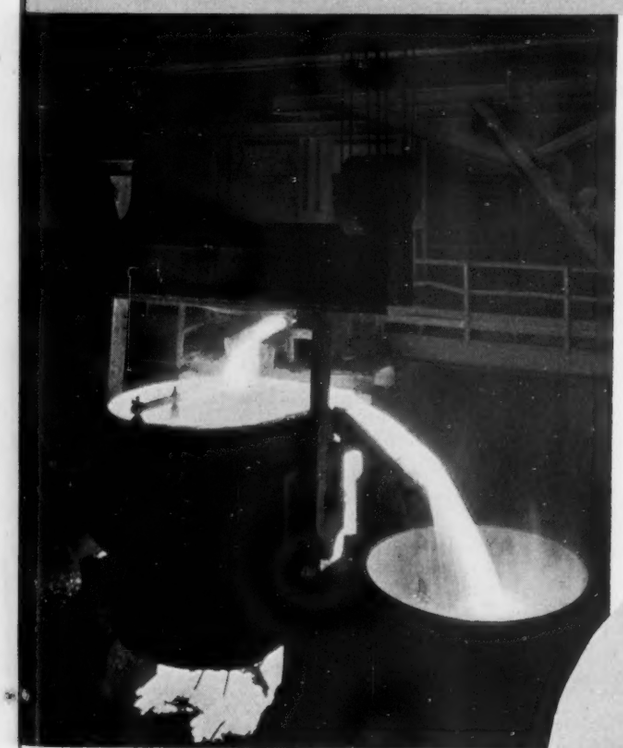

Tapping open hearth furnace, with the crane ready to carry the ladle to the casting floor. To insure critical casting temperatures, timing of the crane's movements is of vital importance.

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and this is done by covering with electricians' tape. The arms of the rack are machined accurately to accommodate the piston pin holes. The holes at the outside, that is those away from the rack, are fitted with accurate wood plugs. The top of each piston, that is as far down as the skirt, is protected by an accurately machined rubber coated cap.

Those not conversant with plating methods may ask why the tin is not deposited on the inside of the piston. The answer is that it is not in an uninterrupted path between the anodes. As a plater would state the case, the plate will not "throw" into such confined places.

After the parts are racked as shown in Fig. 2 they are cleaned electrolytically. The next operation consists of plating. The plating tank is approximately 15 feet long and 5 feet wide and consists of a tank within a tank. The outer tank is filled with water which is heated with natural gas burners to maintain a temperature in the inner tank of 160 degrees, Fahr. The tank as shown in Fig. 3, accomodates 96 pistons or 12 racks.

Controlling Thickness of Plate

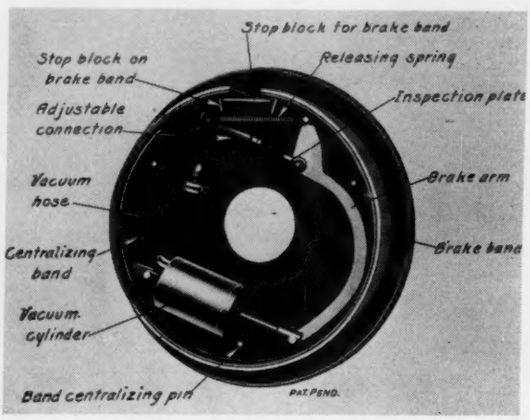
As previously stated, the tin plate is 0.001 inch thick and this thickness must be controlled by the plater himself. Through long experience he learns to keep the heat of the tank and the voltage and amperage of the current within certain limits to give the desired results as no finishing of the plate is permitted after the pistons come from the plating operation. The voltage is between 2 and 4 and the amperage 100. If the plate is too thin this could be remedied by further plating. If it is too thick the plate could be stripped electrolytically, but in either case an extra cost is involved and this is eliminated by paying strict attention to the plating process. After the parts are plated to the desired thickness they are washed in hot water.

The tin surface wearing against the cast-iron cylinder wall makes an ideal contact to take up the initial wear and thus eliminates all dangers of scoring or broken rings. While tin plating of pistons is a comparatively recent development, it has been known for centuries that two metals of different molecular construction make ideal wearing surfaces, such as steel arbors in brass clock frames, bronze boxes for steel crankpins, etc. However, the automobile engineer accomplished something new when he applied the tin plating process to make an old and well known principle successful in solving the needs of this specific case.

New Automotive Brake Is Placed in Production

A new patented, automotive brake, known as the Williams automatic wheel power brake head, after thorough tests, has been placed in production by the Davis Metal Fixture Co., Lansing, Mich. It was developed to meet enforcing laws of various states requiring all heavy duty trailers to be equipped with effective braking mechanism. The makers expect later to apply the new brake to automobiles, motor trucks and buses.

Dependability, easy adjustment, velvet grip are claimed for this brake, which is entirely mechanical and has no electric, hydraulic or boosting adjuncts. It is said to be easy to install, to be effective at any load and any speed and to prevent side swiping.



New automotive brake operates by utilizing the intake manifold in the engine to create vacuum pressure

The accompanying illustration shows an internal view of the brake head and identifies most of the component parts. A steel pipe, not shown, connects the small vacuum cylinder in the brake head to the intake manifold of the engine. At the intake manifold end of the pipe is a valve operated by means of the foot braking pedal. When this valve is opened, the suction of the intake manifold exhausts the air out of the vacuum cylinder in the brake head causing the plunger to be drawn into this cylinder. This action forces out the brake arm and brings the brake shoe up against the stop block; as the wheel turns, the brake shoe is wound outwardly against the brake drum, also not shown in the illustration. The more the wheel tries to turn, states the maker, the more the band winds out, until the entire surface of the band is pressed against the drum.

The backing plate is a malleable casting. Brake band and cylinder plunger rod are of cold rolled steel. The clevises are steel drop forgings. The vacuum cylinder is built of steel, brass or copper. The drums are of cast iron.

Lists Papers for Machine Tool Meeting in Chicago

Chicago section of the American Society of Mechanical Engineers has announced the program for its annual machine shop practice meeting to be held on the afternoon and evening of March 28 in the auditorium of the Engineering building, Chicago. Five technical papers are to be presented, two at the afternoon session and three at the evening session.

A feature of the meeting will be a demonstration of machine tools, some of which are to be discussed in technical papers. C. B. Cole, president, Tool Equipment Sales Co., Chicago, is chairman of the meeting, which will be open to all shop executives interested in machine tools and their operation.

Papers and authors are as follows:

Afternoon

"High-Speed Machining for High-Speed Transportation," by P. S. Jackson, assistant manager, Rockford Machine Tool Co., Rockford, Ill.

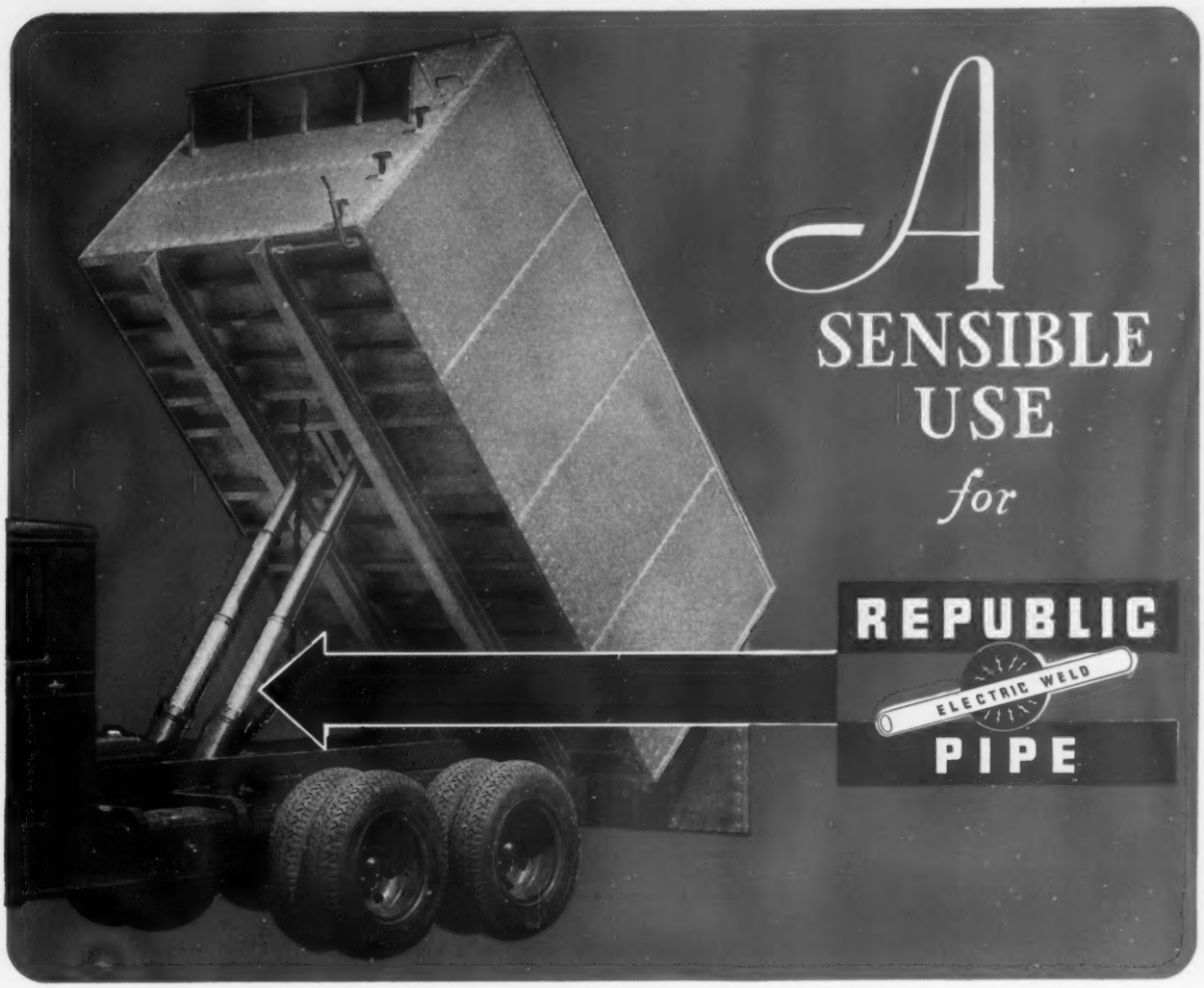
"High-Speed Tapping," by H. Goldberg, vice president, R. G. Haskins & Co., Chicago.

Evening

"The Romance of Perfect Lubrication," by H. A. S. Howarth, vice president and general manager, Kingsbury Machine Works Inc., Philadelphia.

"Probable Trends in the Machinery Industry of 1935," by R. E. W. Harrison, chief, machinery division, department of commerce, Washington.

"Development of High-Speed Production Machine Tools Recently Installed in Detroit," by R. A. Schafer, chief designing engineer, development and experimental department, National Automatic Tool Co., Richmond, Ind.



THIS dump truck hoist is only one of the many sensible applications where Republic Electric Weld Steel Pipe may be used to an advantage. Others are pump parts such as column and tubing on turbine pumps, idler rolls for conveyors, service station auto hoists, frames for motors and generators, and tubular parts for textile, paper mill and printing press machinery.

Many manufacturers are finding it more economical to use Republic Electric Weld Pipe for parts requiring tubular sections instead of tubular sections produced by other methods. They are showing savings through the reduction of machining costs, increased operating efficiency and lower maintenance costs of the finished product.

These are the qualities that make savings possible—a weld as strong as the wall—uniform diameters—uniform wall thickness—perfect concentricity—straightness—and clean surfaces free from scale. Somewhere in the products you manufacture Republic Electric Weld Pipe may improve the quality or cut costs. Investigate.

Republic Steel
CORPORATION
REPUBLIC STEEL

GENERAL OFFICES YOUNGSTOWN, OHIO

Some Factors in Chemical Composition of Steel Scrap

BY R. A. BULL

THE subject of ferrous scrap as related to steel melting practice is one that can be discussed at considerable length, differently to some extent for each kind of furnace commercially employed today. While the time-honored crucible practice continues to be favored to some extent overseas, it no longer is important commercially in America. And while converter practice has become practically obsolete in this country so far as the manufacture of steel castings is concerned, it still exists in some commercial degree in Europe, while holding a small place in the production of steel for wrought products at home.

The writer's experience in steelmaking has been restricted to the manufacture of the metal for castings; in basic open-hearth furnaces, acid open-hearth furnaces, arc furnaces, induction furnaces, converters, and crucible furnaces. While my contacts during the last 15 years have been chiefly with electric steel melting, the major portion of my experience in steel plants has been in connection with open-hearth operation.

Complications in Alloy Scrap

A factor which has served enormously to increase the importance of scrap as a constituent of the cold metal charge used for making steel lies in the very rapid and still growing expansion of the electric branch of the industry. Probably it is well known to all that the number of electric melting furnaces has steadily increased, beginning about 1915. Incidentally, it is interesting to recall that electric steel was first produced commercially in the United States about ten years after success had attended similar efforts in Europe. It was not until 1908 that the first electric steel was made commercially in America.

As you know, today there is a considerable tonnage of electric steel manufactured in this country. The ability to produce satisfactory finished material in electric furnaces without utilizing any pig iron or metal containing a high percentage of carbon as a constituent of the charge places steel scrap among the most important materials with which many melters of high-grade steel are today concerned.

Advancement made by the electric branch of the steel industry has been due largely to the increased demand for alloy steel, for the manufacture of which electric arc and induction furnaces are well adapted. And this growing production of special metal is the biggest factor in gradually building up the content of special alloying elements in commercial steel scrap.

The result of the contained special elements in much of the scrap being accumulated today for sale to steel mills and steel foundries occasionally presents a difficult problem for the steelmaker. Probably this applies to greater extent with small sized scrap sold to electric steel plants than to heavy melting scrap sold to open-hearth plants, due to the sources from which the various kinds of scrap are obtained. Of course, much of the scrap of very convenient size for charging into an electric furnace comes from plants machining considerable alloy steel.

THE accompanying article constitutes a paper presented Feb. 26 at the annual meeting of St. Louis chapter of the Institute of Scrap Iron and Steel Inc. The author, Major R. A. Bull, is a consultant on steel castings, 541 Diversey Parkway, Chicago.

It has become extremely difficult to obtain such scrap which is entirely free from such elements as nickel, chromium, molybdenum, vanadium, etc. Some of these elements, under certain melting conditions, are oxidizable; so that the finished metal bath may contain little or none of the special element which may be present alone. But when such oxidation occurs, necessarily there is a loss in weight, decreasing what we call the yield of salable material from the metal charge. In other cases, such as that of nickel, there is no appreciable loss from oxidation in melting a steel heat; consequently the finished material contains substantially all the nickel that was present in the scrap charged into the furnace.

During the last 15 years in which the consumption of alloy steel has increased greatly, producers and consumers of steel products have acquired a vast amount of important information permitting economic discrimination in the selection of steel for given purposes. Each of several grades of alloy steel which have impressive combinations of physical properties is poorly adapted to certain purposes where a plain carbon steel is preferable. It must not be construed that I have a carbon steel complex; on the contrary, for many years I have been a strong advocate of alloy steel, when carefully selected as to chemical composition and when properly heat treated, for each of many industrial purposes. But unquestionably there is a vast number of applications in which the garden variety of steel, entirely free from most if not all of the special alloying elements, affords the best material from the combined technical-economic viewpoint.

Scrap Must Be Sorted

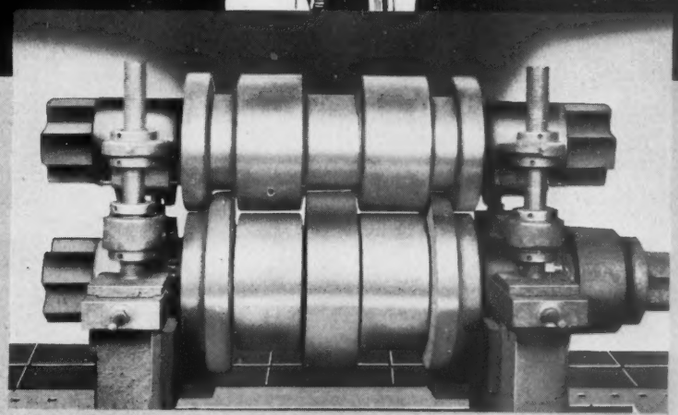
One reason for this is related to the well-established now widely-known fact that many an alloy steel is practically worthless, except when given a careful heat treatment adapted to the chemical composition and to the intended application of the product. This means that, if by reason of the accidental presence of certain special alloying elements in the scrap used for the intended production of carbon steel, metal is delivered from the open-hearth or electric furnace which would need to have expert heat treatment to develop the inherent good properties, the material may be highly unsuitable when it is given no such treatment but is used for the manufacture of parts that might render highly satisfactory service, if made from plain carbon steel.

Many an alloy steel is what metallurgists variously called "teader" or "temperamental", before receiving an initial treatment which will relieve certain stresses developed in cooling after pouring, or during one or more processing operations. An example which illustrates the point, but admittedly is too striking to be actually typical, is found in the behavior of austenitic manganese steel, customarily containing from 10 to 14 per cent manganese. In the condition as cast, this material has practically no engineering value, but after receiving proper heat treatment (which includes a water quench at about 1900 degrees Fahr.) the material is admirable for many purposes for which carbon steel is utterly unsuitable. The heat treatment procedure which is splendidly adapted to the manufacture of parts from certain alloy steels would be destructive to similar parts from some other steels.

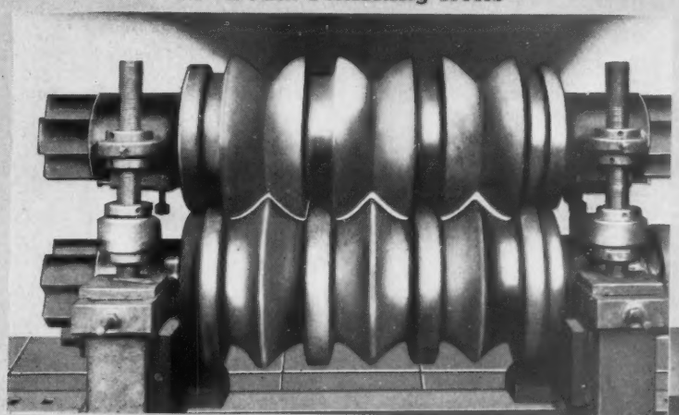
All this perhaps, may emphasize to the scrap dealer the problem now regularly facing many a melter, in need for the careful sorting of scrap, not merely as to size but also as to

(*Please turn to Page* 62)

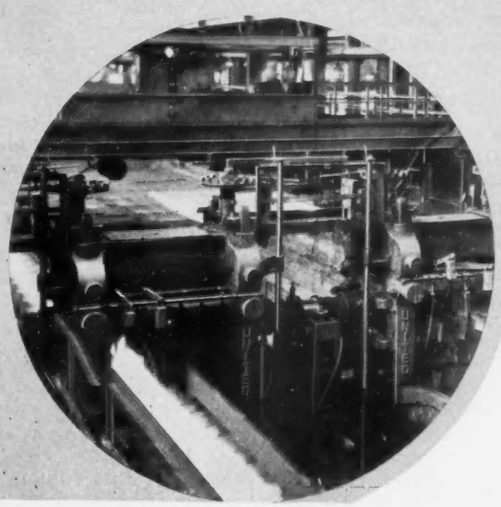
Better ROLLS- *for* EVERY MILL



12" Beam Finishing Rolls

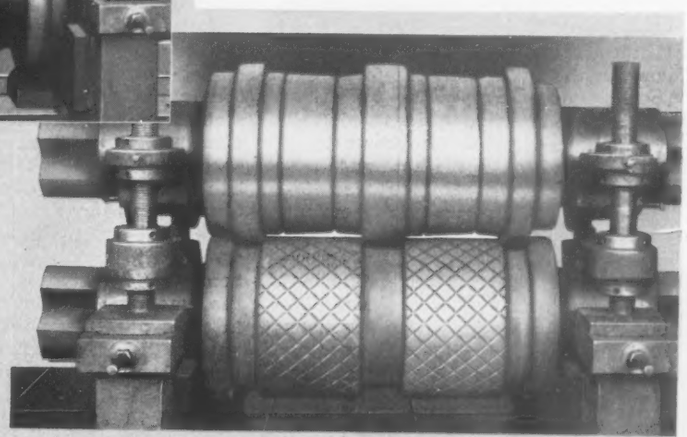


8" x 8" Angle Intermediate Rolls



The expression "a roll for every mill" is not an idle one, and it has been the good fortune of **UNITED** to co-operate year after year in selecting for this mill or that one, the roll which performs better than the the rolls used in it before.

A large corps of trained and experienced engineers, a staff of skilled metallurgists and a force of trained roll men with roll shop experience are constantly maintained, and will be glad to co-operate in every possible way in effecting high-production and economy in rolling.

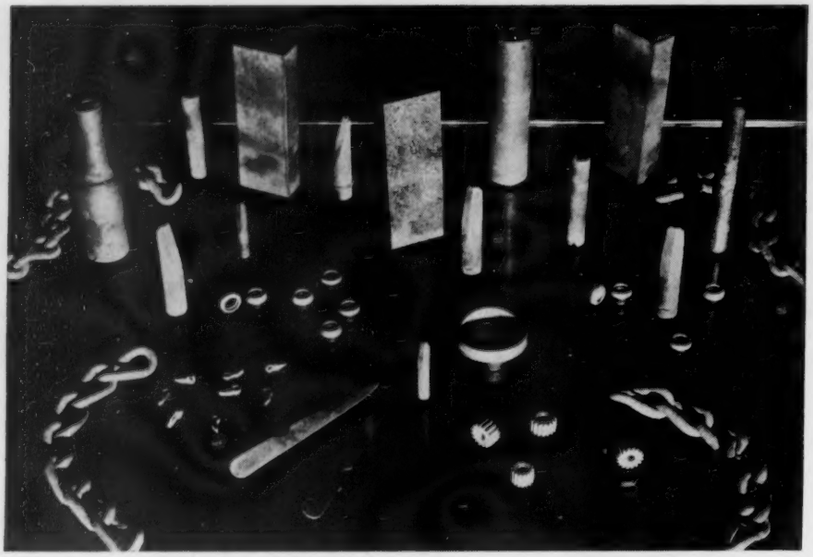


24" x 48" Tie Plate Finishers

UNITED

ENGINEERING *and* FOUNDRY COMPANY

PITTSBURGH — PENNSYLVANIA



Here are shown a wide assortment of small steel parts hardened by the new liquid medium carburizing process. Penetration is rapid and the case hard and durable

Liquid Carburizing Medium Produces Deep, Uniform Case

METHODS for carburizing steel have been the subject of research for many years, the object being to find a process which would shorten the carburizing time, provide uniformity in depth of case and hardness, reduce handling costs and increase production. As a result of its work in this field, the research staff of E. F. Houghton & Co., Philadelphia, has recently developed a process and placed on the market a liquid carburizing medium which the company believes meets the foregoing specifications.

The new process, tradenamed Perlitonizing, employs two materials; namely, Perliton liquid heat and Perliton carbon. The former material is a pink, nonhydroscopic chemical compound in powdered form having a melting point of 1100 degrees Fahr. (600 degrees Cent.). The latter is a chemical compound containing a prepared activated amorphous carbon, black in color and ranging from a walnut size down to rice size.

Details of Procedure

Any salt bath furnace capable of sustaining heat of 1500 to 1675 degrees Fahr. (800 to 910 degrees Cent.) can be used for the medium. Oil, gas or electricity can be used for heating.

The liquid carburizing bath is prepared by melting in a new or clean pot sufficient liquid heat to just about half fill the pot. The heating should be relatively slow and not at any greater rate than 400 degrees Fahr. (200 degrees Cent.) per hour. When the original charge of liquid heat is thoroughly melted, additional liquid heat is added and melted and this procedure continued until the pot is within 3 or 4 inches from the top. The temperature is then raised to approximately 1250 degrees Fahr. (680 degrees Cent.) and any scum or impurities which come to the surface of the pot are skimmed off.

Small quantities of the carbon are then added to the top of the pot and a chemical reaction is noticed to take place as the carbon becomes dissolved in the liquid heat. The carbon is added until a slight crust or black lines or veins are noticed which do not disappear. This amounts to a total addition of carbon of approximately 3 per cent of the amount of liquid heat contained in the pot. For example, if the pot contains 100 pounds of melted liquid heat, approximately 3 pounds of carbon will be added in increments of 6 to 12 ounces at a time. The amount of carbon consumed varies somewhat with the shape of the pot, the carburizing temperature, the amount of work entering and leaving the pot per hour, etc.

Work to be carburized may be suspended in the bath by means of wires, placed in baskets, or held in forms or clamps for the required length of time. The carburizing temperature for the process varies between 1500 and 1675 degrees Fahr. (820 to 910 degrees Cent.). All types of carburizing steels, such as S.A.E. 1010, S.A.E. 1020; the nickel steels of the 2300 series, such as 2315 and 2320; the nickel-chrome steels, such as 3115 and 3120; and wrought iron can be carburized by the process.

The following tabulation is said to be typical of the depth of case obtained on S.A.E. 1020 steel at a temperature of 1550 degrees Fahr. (845 degrees Cent.):

Time, minutes	Depth of case, inches
15	0.0055-0.0088
30	0.0070-0.0100
60	0.0119-0.0140
120	0.0160-0.0180
180	0.0190-0.0300
240	0.0350-0.0400

Work which has been carburized by the liquid medium can be handled the same as pack carburized work, that is to say, can be cooled in the air, quenched in water, brine, alkaline solutions, or oil. Hardness of the case is claimed to be identical with the hardness obtained by pack carburizing processes and the same rules and quenching methods apply in obtaining the hardness. Work which has been carburized is clean, free from scale and ready for the final grind or polish. Threaded parts, such as setscrews, nuts, bolts, and the like, quenched in oil are cleaned readily in alkaline cleaning solutions.

Particularly Useful for Small Parts

The new process, it is stated, is particularly adaptable for small parts, such as nuts, setscrews, dies, gears, pinions, tools, chains, typewriter and adding machine parts, textile parts, and the like. Some carburized parts are shown in the accompanying illustration.

Some idea as to the carburizing speed and consumption of materials may be gained from one test which showed that 56,000 pounds of steel were carburized in 1237 hours using 1 pound of liquid heat for each 75 pounds of steel.

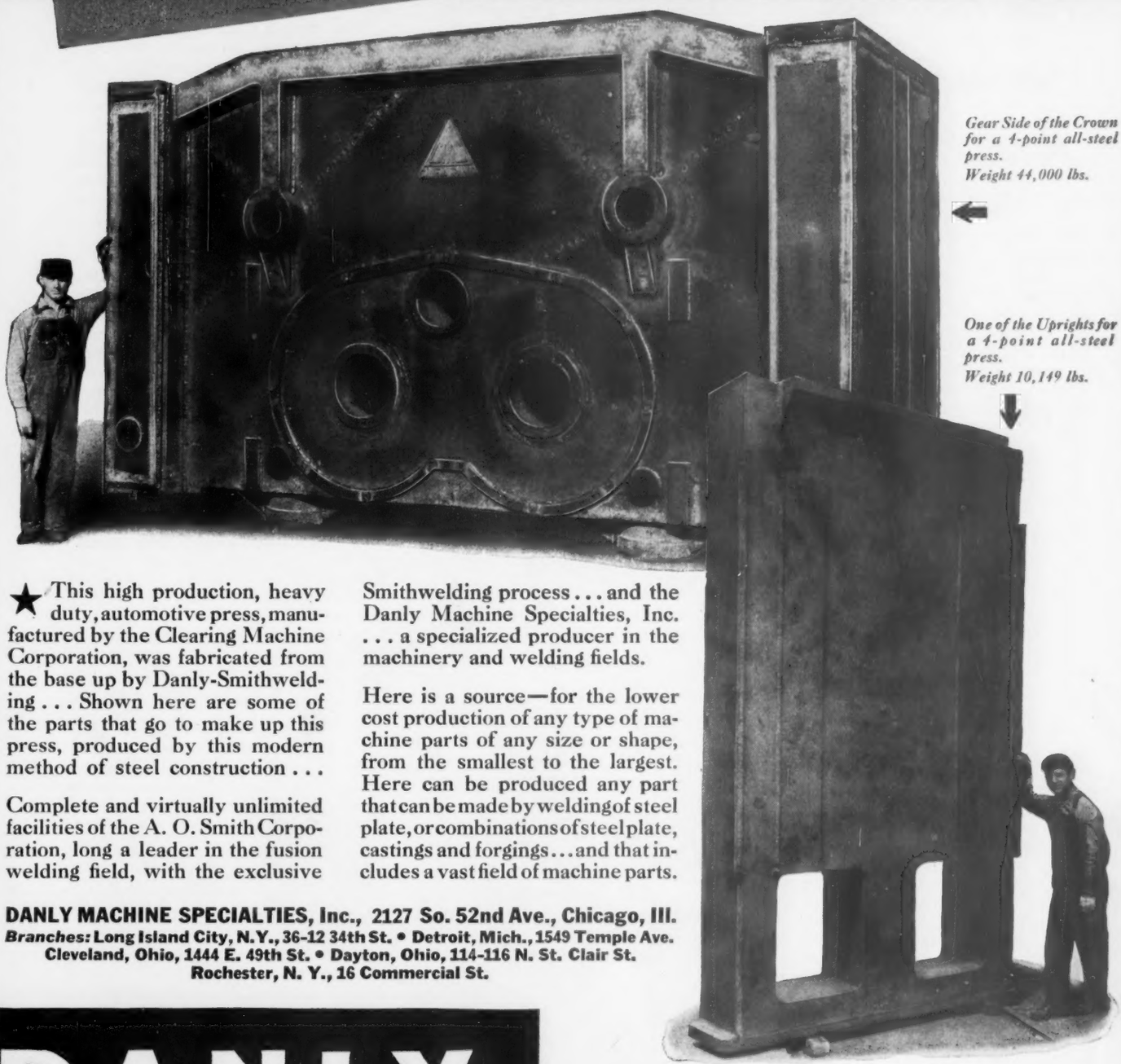
Advantages claimed for the process are long pot life; highly desirable properties, such as rapid penetration, uniform depth of case and a hard durable case; low consumption of material and fuel; ease in cleaning work after oil quenching; and a product which does not rust readily.

Design Changes Made To Improve Stoker Operation

Standard Gear Book, by Reginald Trautschold; cloth, 314 pages, 6 x 9 inches; published by McGraw-Hill Book Co., New York; supplied by STEEL, Cleveland, for $3, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The purpose of this volume is to

DANLY-SMITHWELDING FOR THE *Mechanical Industries*



Gear Side of the Crown for a 4-point all-steel press.
Weight 44,000 lbs.

One of the Uprights for a 4-point all-steel press.
Weight 10,149 lbs.

★ This high production, heavy duty, automotive press, manufactured by the Clearing Machine Corporation, was fabricated from the base up by Danly-Smithwelding . . . Shown here are some of the parts that go to make up this press, produced by this modern method of steel construction . . .

Complete and virtually unlimited facilities of the A. O. Smith Corporation, long a leader in the fusion welding field, with the exclusive Smithwelding process . . . and the Danly Machine Specialties, Inc. . . . a specialized producer in the machinery and welding fields.

Here is a source—for the lower cost production of any type of machine parts of any size or shape, from the smallest to the largest. Here can be produced any part that can be made by welding of steel plate, or combinations of steel plate, castings and forgings . . . and that includes a vast field of machine parts.

DANLY MACHINE SPECIALTIES, Inc., 2127 So. 52nd Ave., Chicago, Ill.
Branches: **Long Island City, N.Y., 36-12 34th St. • Detroit, Mich., 1549 Temple Ave.**
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DANLY SMITHWELDING

supply the facts behind important advances in commercial gear production practices of the past quarter century and to repeat the basic principles upon which the operation of modern gear-producing machines and the art of gear designing are founded. It aims to be of assistance to the machine builder as well as to the gear designer.

The effort has been constantly to produce a practical treatise on gearing that is presented simply, clearly and in a way to assist the builder of gear-production equipment, the gear designer and the commercial user of gears.

Chapters cover tooth forms, speeds and powers, gear proportions and design, spur gear calculations, various gear forms; methods of production; materials and heat treatment; measurement of gear teeth; rolled gearing. An appendix gives working formulas and tables in gear design. An index is included.

New Automatic Welding Process Uses Heavily Coated Woven Welding Wire

A PRACTICAL system of metallic arc, automatic welding has been developed by the Welding Wire Co., 28 Harvard street, New Britain, Conn. In this system the electrode is in the form of woven welding wire, heavily coated, which is used with a contactor apparatus shown in the accompanying illustration. In effect, this contactor is an adapted General Electric automatic seam, multiple head welder.

Four of these units now are in successful operation at the plant of the Walsh Holyoke Steam Boiler Works, Holyoke, Mass., where they are being used in the fabrication of 48-inch diameter pipe, of ¾-inch steel plate, for the metropolitan water supply, Boston. The welds produced show the high physical qualities required for class 1 welding.

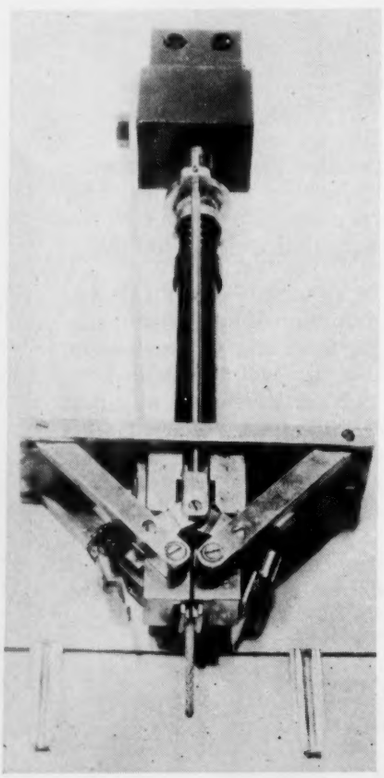
The process is fully automatic in electrode feed, arc length, travel carriage and other features, so that the entire operation may be controlled by push button start and stop.

Details of Electrode

Woven welding wire as used in this process consists of a solid core, with multiple strands of wire woven thereon in the nature of a mesh, the pockets of which are filled with flux. The weave or woven wire being an integral part of the core suffices for current path to the core through an auxiliary contactor. The mesh in this construction of woven welding wire, which keys the flux to the electrode, also in this type of electrode allows passage of high currents to the core at the contact point, due to the drop in potential created by the resistance at the crossings of the weave or mesh, from the contact point to the fusion or arc zone. The coating thickness of woven welding wire is consistently uniform throughout its linear length as well as to the encasement of the core, due to this braided type of construction. The diameter of the weaving wire governs the total flux thickness as weaving with .023 wire gives a total flux thickness of .046 totally surrounding the core.

Woven welding wire is a negative electrode and has a faster flow property negative than positive.

The electrode contactor apparatus used with woven welding wire is a toggeling, free passage unit that allows free passage of foreign matter as well as separation of the mechanical control from the contactor. As a result, the control is non-conductive from the current and heat



Electrode contactor used in new metallic arc, automatic welding process

standpoints, thus assuring long life to the mechanical members.

Tangential grip feed rolls used on the electrode feed have definitely controlled feed and gripping action. Pressure employed is no greater than required to prevent roll slippage and is not sufficiently great to distort the electrode.

A single adjustment, plunger roll type of straightener is included so as to eliminate the frictional wear on the contactor inserts. These inserts are of cadmium copper and have long life for this duty. An original set of inserts has been in operation for more than three months and shows no appreciable wear.

The take off reel consists of a tapered-barrel, all-steel, demountable rim reel, having thereon a sliding ground contactor, which makes use of the electrode coil, as a high resistance, to balance the variable resistance of the arc; this eliminates highly objectionable arc stray. Too, current may be taken direct from the reel should foreign matter enter the contactor tips.

Welds Have Good Characteristics

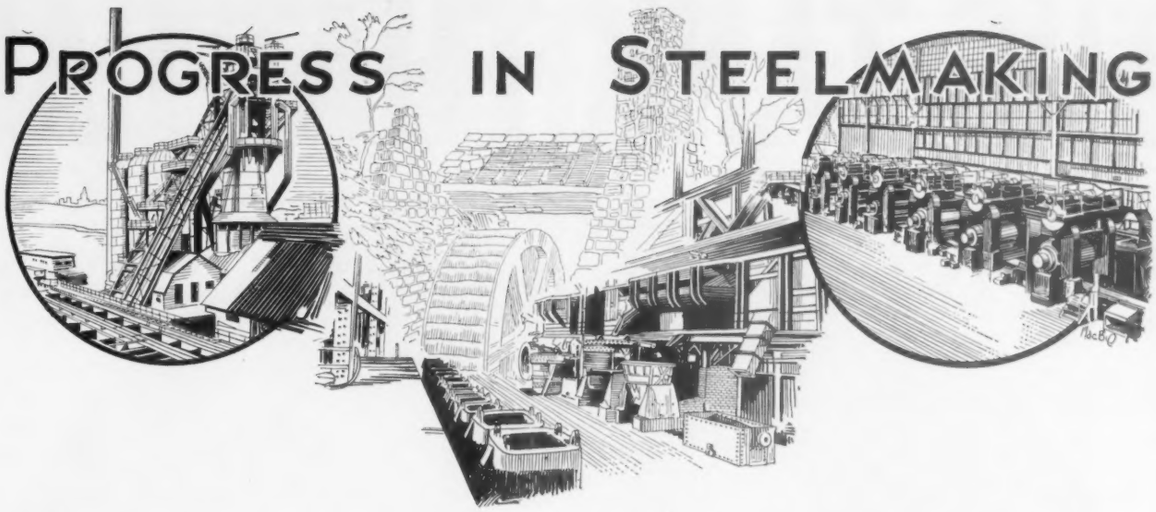
Welds made with woven welding wire and electrode contactor apparatus tensile 75,000 to 80,000 pounds per square inch and show an elongation of 25 to 30 per cent in one inch. An actual test specimen made on ¾-inch plate thickness, two layers on a single pass, tensiled 79,250 pounds per square inch, with an elongation of 28.4 per cent in one inch. No cleaning of the resulting flux formation on the deposit weld was required between subsequent layers of the weld metal, as the flux of woven welding wire is full floating and on cooling is self removing. Attained speed in welding by this method is about 15½ inches per minute.

This equipment is adaptable to all standard automatic metallic arc welding units, and requires no direct changes in the unit construction.

Woven welding wire is furnished in coils having a tapered bore so as to be readily placed on the reel for use. The average coil change is made in less than one minute. Straightened and cut lengths of woven welding wire are available for manual operation, packed in 50-pound boxes. Standard stock sizes include ⅛, 5/32, 3/16, ¼ and 5/16-inch diameters.

The new process is covered by patents and letters patent applied for by the Welding Wire Co., of which Albert M. Ross is president. This comapny also has obtained a license under the patents of C. J. Holslag, Electric Arc Cutting & Welding Co., Newark, N. J., involving elements contained in the flux used in coating the woven welding wire.

PROGRESS IN STEELMAKING



Brick Absorbs Stresses

Plastic type insulating materials used on the walls of open hearths generally are not used back of the furnace buckstays. Many open-hearth operators are working with resilient, compactible brick, built into the wall behind the buckstays in order to absorb the stress of the expanding brickwork without transmitting the stress to the buckstays. This type brick being a good insulator, according to a refractory producer, also serves to keep the buckstays cool.

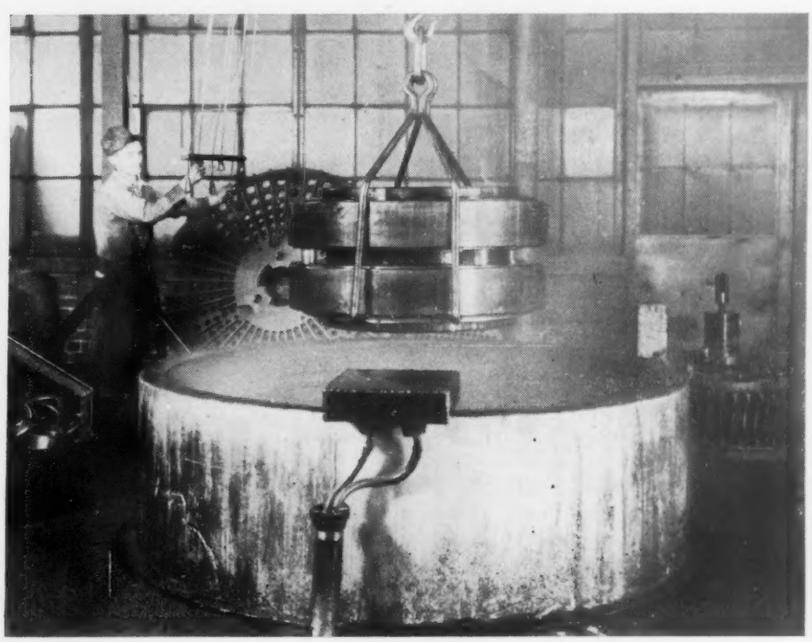
• • •

Simplifies Switch Design

Foot-operated master switches for controlling reversing blooming mills recently have been improved. Design is much simpler than previous models, which results in greatly reduced maintenance and will facilitate such repairs as may be necessary. Two foot pedals, one on each side of the switch, are employed. On the shaft between the pedals are mounted steel cams which bear against steel ball-bearing rollers mounted on Textolite blocks which carry the moving compacts. Each pedal operates a portion of the shaft, so that depressing one causes forward operation of the mill, and depressing the other reverses it. By means of an interlocking arrangement only one pedal can be depressed at a time. The unit is extremely easy to operate so that it does not tire the operator.

Removes Work Hardening Strains

PREMATURE STEEL FAILURE IS AVOIDED—When rolling mills are in practically continuous service, it has been found advisable to draw the roller bearings about every three months to remove any work hardening strains. For intermittent service, a six months interval may be sufficient. The oil drawing tank used by the Timken Roller Bearing Co., Canton, O., for rejuvenating steel mill roll neck bearings, shown below, is electrically heated. Treating the bearings in pairs as well as complete assemblies has been found satisfactory. This type furnace, which was built by the Electric Furnace Co., Salem, O., also can be employed for removing the work hardness from gears, rolls, pinions and small bearings



• • •

Pipe Connections Welded

All joints of an 800-foot hydraulic pipe line serving the blooming and strip mills of an Ohio company are of welded construction. All 90 and 45-degree bends in this line were made of pipe bends instead of flange fittings, the line thus being free from any irregularities and obstructions on the interior.

• • •

Equalizes Travel of Gases

The tendency in relining blast furnaces continues toward increasing the top diameter in order to reduce the velocity of the gases, according to a blast furnace engineer. In rebuilding a stack in the Great Lakes district recently, the four offtakes were led into a single downcomer, one of the objects being to equalize the travel of the gases and thereby encourage uniformity of gas velocities in the furnace top. This furnace, according to latest reports, is making not to exceed 75 pounds of flue dust per ton of iron at a normal rate of blowing. As a further indication of uniform furnace movement, not a single tuyere has been

THE TANK THAT CAN

● *Applying Triflex lining inside a steel railroad tank car, used in transporting 40% formaldehyde solution.*

● (LOWER LEFT) *Installing brick sheathing inside a Triflex-lined steel pickling tank used by a large manufacturer of automobile frames. Note Triflex expansion joints in the rubber lining of the tank.*

● (LOWER RIGHT) *One step in the Vulcalock process, which provides an integral bond between rubber and steel.*

Goodrich

BE REPAIRED • • •

But doesn't need it

Reading time 75 seconds

WHEREVER there has been acid in industry there have been leaks. Wherever there have been leaks there have been waste, trouble, elaborate repairs, time lost, heavy expense.

With one stroke you can do away with all this drain on profit. Install Goodrich Tanks with Triflex Rubber Lining.

Goodrich Tanks don't leak, because they have not one lining but three—a layer of hard rubber cushioned between two layers of soft rubber and fitted with expansion joints so the rubber will not buckle or crack. This 3-layer (Triflex) lining is permanently and inseparably bonded to the inside of a steel tank by the exclusive Vulcalock process. For severe, rough-and-tumble service and high temperatures, brick sheathing is added inside the rubber.

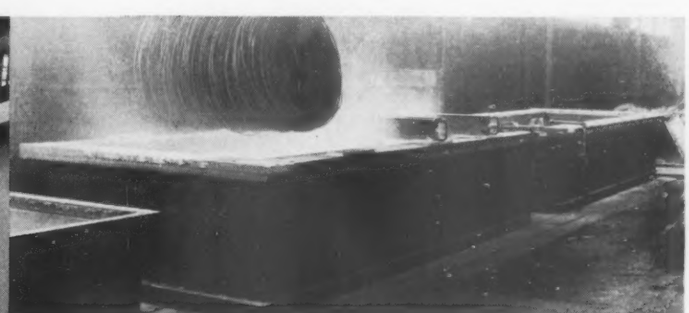
Such a tank will last indefinitely—many of our customers say they expect their tanks to last 10 to 15 years without a leak. But suppose the rubber should be cut through some unforseen accident. In most rubber and metal tanks the bond is weak, the acid would creep many feet or yards, and an entire tank side could be ruined. But in Goodrich Tanks the mighty Vulcalock bond permits no creeping. Any hole would appear exactly opposite the hole in the lining, so it could be found at once and repaired on the job, with little or no time lost. Hard rubber alone is difficult to repair, but with Goodrich hard-and-soft rubber lining, a patch can be made and vulcanized, and the lining becomes as good as new.

Only Goodrich Tanks can give you these many savings, this freedom from trouble, because only Goodrich Tanks have the Triflex construction and the Vulcalock bond.

Think of the money saving, the time saving, the relief, of acid tanks that do not leak! Let Goodrich engineers tell you, without obligation of course, about the scores of "impossible" acid operations which they have made simple and profitable for the operators. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio. (In Canada: Canadian Goodrich Company, Ltd., Kitchener, Ont.)

• *Triflex-lined pickling tank just after it was lined by Goodrich in the plant of a manufacturer of electrical appliances. Photo shows the tank before brick sheathing was installed.*

• *Brick-sheathed Triflex-lined pickling tank in the plant of a rod manufacturer.*



GOODRICH MECHANICAL RUBBER GOODS INCLUDE:
Rubber Lining for Storage, Pickling and Plating Tanks, Tank Cars, Pipe and Valves... Conveyor, Elevator and Transmission Belting... Acid, Air, Steam, Suction and Fire Hose... Hard Rubber Goods... Packing... Molded Rubber Products .... and a Complete Line of Miscellaneous Rubber Items.

Rubber Lining

ALL *products problems* IN RUBBER

burned during the past year's operation.

• • •

Adopts Drawing Process

Many manufacturers of wire, cold drawn bars, strip, sheets and tubes in England have adopted a new process for drawing without the use of lime. A powdered product, known as "Molco", is the basis of the process. After pickling and rinsing, the steel is immersed in a cold bath of the Molco neutralizing liquid which coats the commodity with a slight transparent film. This film enables the surface condition of the steel to be observed during the manufacturing cycle. No lime bath is necessary nor are drying ovens required, since the occluded hydrogen will dry in the open air. However, ovens can be used to hasten the drying operation if so desired. The process, it is claimed, assures a bright surface, the material treated being free from pores or pitting. When drawing fine wire, no marks remain. The coating being nonhygroscopic, enables the material to be stored several days before being processed; large batches, therefore, may be treated and held in stock.

MOST OF US often wonder what this or that steel plant is doing in the way of improving its practice. There was a time when we did more visiting but lately conditions keep us close to our work.

We can make these visits by proxy, however, for every week, in this section, STEEL takes you in many plants and gives you the opportunity of securing profitable ideas in a fraction of the time it would take you to secure them yourself.

If you desire further information on any idea, announcement, lead or suggestion presented, please write us. Perhaps you know of an idea or "shop wrinkle" that has effected a reduction in operating costs at your plant. If so, won't you send it along?

The Editors

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Checks Bloom Temperature

Checking the temperature of reheated blooms before they are rolled is accomplished at a plant in this country by a photoelectric pyrometer. If the temperature is not within certain limits, the steel is not fed into the mill.

Some Factors in Chemical Composition of Scrap

(*Concluded from Page* 54)

the content of special alloying elements.

There is another factor which may be mentioned in this matter of chemical composition and its influence on the satisfactory melting and conditioning of a heat of steel. During the last 15 years, and perhaps particularly within the last decade, steel melting practice in this country, especially in open-hearth foundries, has gradually changed in respect to the preferred percentage of scrap used for the metal charge. By various details of practice it has been found economical in open-hearth melting to depend to lesser extent than formerly on pig iron for the contained constituent of carbon. The result has been a gradual but on the whole an impressive increase in the proportion of scrap used.

Now it is the belief of most open-hearth melters that they get the desired action in the bath when it is necessary to oxidize considerable carbon. Of course this necessitates a fair amount of that element in the bath. If a relatively small percentage of the charge consists of pig iron and the major proportion consists of steel scrap, the final result may not be satisfactory if the average content of carbon in the scrap used is very low. This indicates a definite preference felt by some open-hearth steelmakers for some steel scrap which carries a rather high percentage of carbon.

Dealer and Melter Must Cooperate

In this connection, one may casually think at once of the high carbon content in cast-iron scrap. Considered alone this would serve the purpose suggested, but unfortunately ordinary cast-iron scrap contains other elements, such as phosphorus, in amounts which cause very undesirable conditions in steel, either in melting or in the finished material, or in both.

From whatever angle we view the present situation in respect to anticipated developments, we may perceive the advantage, first, of knowing the chemical composition of the scrap used; second, of providing for careful discrimination and storage by the scrap dealer on the basis of chemical composition; third, of co-operation between dealer and melter for the manifest advantage of all concerned.

In the latter connection, I am prompted to make a final comment which has a slight personal significance. For more than 40 years, I have had intimate contact with iron and steel manufacture. It has been of extreme interest and considerable pleasure to me to observe the way in which business policies followed by scrap dealers have gradually become more ethical as the years have gone by. There is still room for a great deal of improvement along these lines, as you yourselves know.

Institute Has Responsibility

Doubtless you realize, as I think steel producers do, that the Institute of Scrap Iron and Steel is capable of advancing ethical conduct in the handling of metal scrap to a greater extent that probably would be possible for any other organization. This places a responsibility on members of this institute. The opportunity for helping everybody concerned, and eventually of improving your own status, carries with it a definite obligation. I have not the slightest doubt that the technical men connected with the steel industry desire to co-operate heartily in the task of fulfilling these obligations, and playing a useful part in the effort to make better steel cheaper, and thereby fortify the position of ferrous material in this era of sharp competition between metals.

Elementary Study of Steel Working and Treating

Working, Heat-Treating and Welding of Steel, by Harry L. Campbell; cloth, 185 pages, 6 x 9 inches; published by John Wiley & Sons Inc., New York; supplied by STEEL, Cleveland, for $2.25, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The author is associate professor of metal processing at the University of Michigan and in this volume he has presented a concise statement of the basic principles and practices relating to certain prescribed phases of the metallurgy of steel.

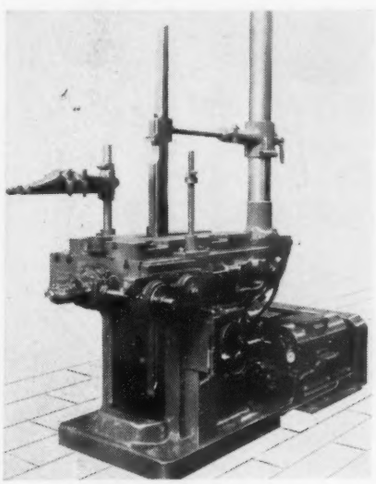
The purpose of this textbook is to cover the art of working, heat treating and welding of steel. The groundwork is laid in the opening chapters by a description of steelmaking processes and classification of steel. Since the properties of steel are dependent to a large extent on the mechanical working and heat treatment of the metal these topics are fully discussed. Methods of protection from corrosion are also covered. A series of laboratory assignments is included as a guide to the laboratory instruction usually given as part of this course. Many operations of shop practice are included.

The book is planned to assist in the introductory study of certain phases of the metallurgy of steel, omitting all unnecessary terms and discussions belonging to more advanced study of these topics. Charts, diagrams, section drawings and micrographs are presented.

NEW EQUIPMENT

Keyway Cutter and Slotting Unit—

Morton Mfg. Co., Broadway and Hoyt, Muskegon Heights, Mich., recently introduced a keyway cutter and slotting machine wherein the work remains stationary at all times. Top plate of the machine, shown herewith, is rectangular and is T-slotted on the top surface to facilitate the use of binding bolts and other supporting means in unsymmetrical work. An auxiliary top plate is used between the main top plate and the work, primarily as a protection in the handling of



New Morton stationary keyway cutter and slotting machine

heavy work. The auxiliary top plate also contains the centering jaws for centering all diameters of bores with a minimum amount of equipment.

A bracket is bolted to the front of the top plate which contains a rotating nut and screw mechanism for feed and relief. A locking collar graduated in thousandths provides a means for setting to total depth of cut. Ratchet feed mechanism with feeds ranging from 0.001 to 0.020 of stroke is also attached to the top plate.

The guide contains all of the gearing for transmitting the power to the spiral cut pinion and rack which reciprocates the cross head and the cutter bars. This guide is journalled in a special trunnion member. A positive means is provided for locking the guide with the trunnion member. Guide, cross head and bar may be thus adjusted to any angular position with the top surface of the top plate up to 1-inch taper per foot.

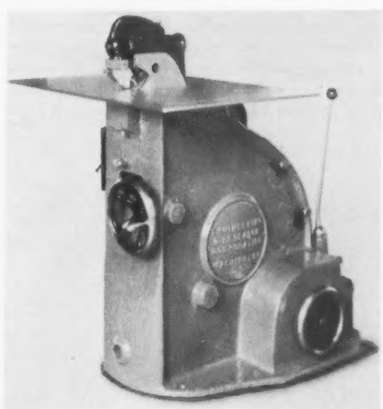
♦ ♦ ♦

Sheet Metal Former—

Engineering & Research Corp., 2014 Fifth street, N. E., Washington, recently placed on the market a forming and flanging machine adapted to all industries fabricating sheet metals such as aluminum, zinc, brass, soft and semihard steel, monel metal and stainless steel. The "Erco" method of forming the straight and curved edges of sheet metal is through the oscillation of a short brake at a speed of 165 to 500 strokes per minute. The total angle of this motion is controlled by a handwheel at the front of the machine, shown herewith.

Forming is accomplished by hand-feeding the work under a hold-down tool and lightly pressing the edge to be flanged against an arc-shaped guide. This guide is an integral part of the hold-down tool and has an arc radius equal to the height of the flange to be formed. In addition to its guide function, the hold-down tool clamps the work to the table during the up stroke of the brake and provides the forming surface against which the edge is shaped

Flanges can be formed on the ends of cylinders of larger diameter than eight inches by removing the table and inserting a curved shoe under



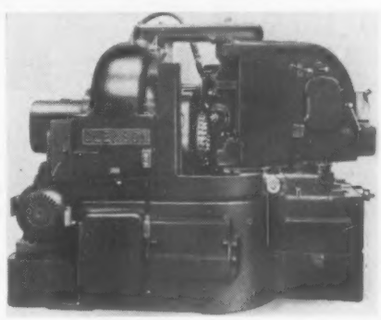
Flanging and forming machine built by Engineering & Research Corp.

the hold-down tool. Gearing and the simple linkage of the drive mechanism is below the table and fully enclosed. The machine is built in model S with one operating speed of 500 strokes per minute, recommended for the lighter classes of work, and in model H. D. with a three-speed transmission operating at 165,330 and 500 strokes per minute.

♦ ♦ ♦

Spiral Bevel Pinion Rougher—

Gleason Works, 1000 University avenue, Rochester, N. Y., recently brought out a new spiral bevel pinion rougher, shown herewith. This new unit is hydraulic in all its movements except the drive to the cutter.

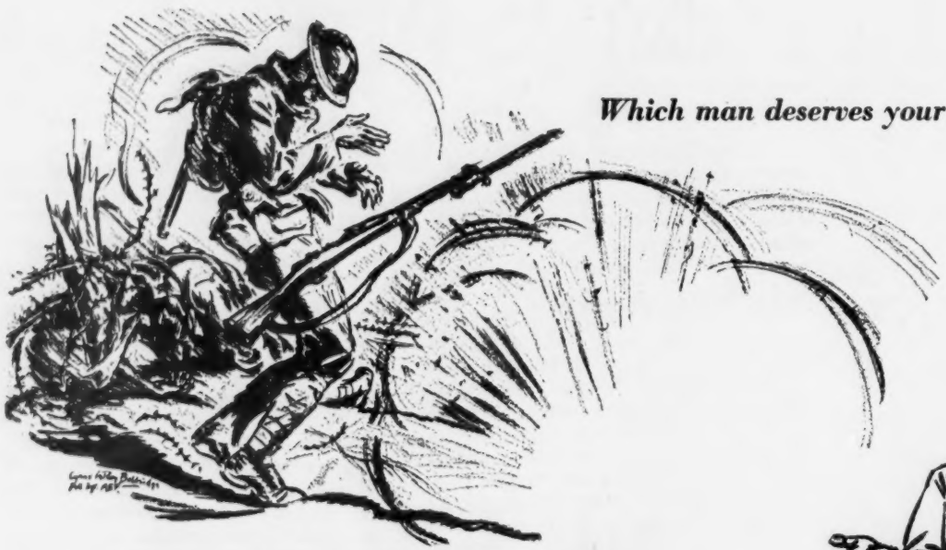


Gleason machine roughs both spiral bevel and hypoid pinions

Cutter is mounted in a full circular cradle, permitting adjustments through 360 degrees to cut both spiral bevel and hypoid pinions. The workhead which is mounted on a large and sturdy sliding base, swings about an axis other than the center of the machine so that when removing the work from the spindle there is ample clearance between the work and cutter for convenience in removing and replacing pinions.

The workholding spindle is sufficiently large in diameter to accommodate taper bores up to 3.906 inches. An outboard support holds the pinion rigidly against deflection from the thrust of the cut. The chuck is operated hydraulically. Because of this feature the change-time has been greatly reduced, a close study of chucking operations revealing an average change-time of only ten seconds.

The machine is arranged auto-



Which man deserves your tax money?

Let's Kill the Pension Racket *Now!*

You Who Pay the Bills Read This

• • •

WAR OF 1812:—Last soldier died 1905. Five widows, one remarried widow and one daughter still receiving benefits.

WAR WITH MEXICO:—Last soldier died 1929. 415 widows still receiving benefits.

CIVIL WAR:—$7,698,000,000 paid to date, with approximately $98,000,000 present annual outlay. *All veterans and war widows entitled to benefits.*

SPANISH AMERICAN WAR:—$811,819,000 expended to date. Annual outlay more than $110,000,000. *Virtually all veterans and war widows entitled to benefits.*

WORLD WAR:—Record of constant liberalization. Number of beneficiaries increased more than 100 per cent from 1930 to 1932. Total mobilized in the war, 4,300,000 men. *Already—only 16 years after the Peace —over 1,900,000 claims have been filed.*

Here's How You Can Help Stop It!

• • •

The American Veterans Association, consisting solely of veterans, is fighting to protect and defend the rights of *the truly war disabled* and *the dependents of the war dead* against political exploitation.

We believe that Federal compensation in the form of war pensions should be restricted to:

1. *Those wounded in combat.*
2. *Those suffering from injury or disease incurred, in fact, in line of duty.*
3. *The dependents of those killed in action and of those who died of wounds, injury or disease incurred, in fact, in line of duty.*

If you believe in pension reform based on the *three-point plan* of the American Veterans Association, here is your opportunity to register your vote. Remember, you pay the taxes that pay the pension bill. Unless you are on the alert and prevent a repetition of the pension rackets of the past, your great, great, great, grandchildren will be paying pensions for the World War in the year 2040. Fill in this coupon today and help to end the pension racket.

"Justice to the WAR WOUNDED • Justice to the WAR DEAD • Justice to the AMERICAN PEOPLE"

MAIL THE COUPON

Citizen's Vote

AMERICAN VETERANS ASSOCIATION, INC.
420 Lexington Avenue, New York City

Please record my vote in favor of the A. V. A. 3-Point Pension Program, and mail me, without obligation, your booklet "Let's Kill The Pension Racket."

Name.....

Street.....

Post Office..... State.....

Veteran's Vote

AMERICAN VETERANS ASSOCIATION, INC.
420 Lexington Avenue, New York City

As a veteran, I approve and vote for the A. V. A. 3-Point Pension Program. Please enter me as a member and mail me your booklet without cost. I enclose $2 membership dues.

Name.....

Street.....

Post Office..... State.....

Rank..... Branch of Service.....

War Service.....

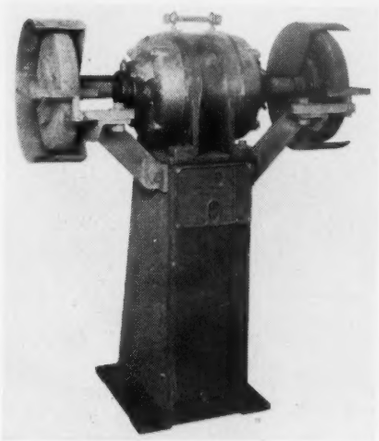
This advertisement is made possible by a special fund raised in memory of men killed in action

matically so that as the last tooth is cut the workhead is withdrawn at full speed to the chucking operation. A single lever is employed to dechuck the work. A power-stripper mechanism also is provided to eject the cut pinion so that it is loosened ready for removal. The machine is interlocked to prevent the feed from being started unless the cutter is running and the work is chucked. Likewise, the work cannot be dechucked or the cutter stopped while the blank is in cutting position.

♦ ♦ ♦

Heavy-Duty Grinder—

The Production Equipment Co., Cleveland has added to its line the grinder shown in the accompanying illustration, to meet the demand for a heavy-duty, low cost machine. The motor is semi-enclosed to allow sustained overloads without excessive



Heavy-duty grinder placed on the market by Production Equipment Co.

temperature rise. The spindle is of alloy steel, liberal in size, and is supplied with flanges and safety type threads. The guards are of steel held by a strap mounted across the rear of the motor. Machines are supplied with either manually operated or automatic starters. Standard designs are built for 14, 16, 18 and 20-inch diameter wheels in ratings from 3 to 10 horsepower.

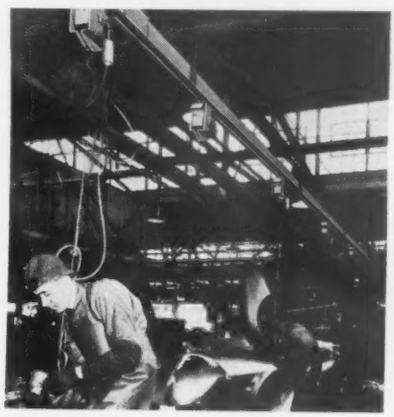
♦ ♦ ♦

Trolley Square-Duct—

Square D Co., Switch & Panel division, Detroit, is introducing a system for providing mobile electric circuits for portable tools so that work can be followed along conveyor and assembly lines without the use of long and unwieldy cords and cables. The system, shown herewith, consists of an almost entirely closed duct containing stationary busses, along which travels a carriage or trolley. Collector wheels of the trolley transmit the current by means of wire connectors to the tools.

One type of duct section has a "gate" which can be pushed back, permitting the removal or insertion of a trolley. Curved sections also are manufactured to meet building or manufacturing requirements. Feeders or sub-feeders can be brought into the system at any point by means of special connection boxes, which do not interfere with the operation of the trolleys.

Any number of trolleys can be operated on the system, the duct supporting at least five trolleys per 10-



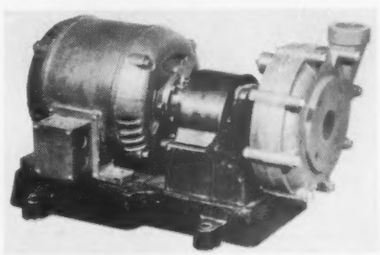
Square D trolley duct provides mobile electric circuits

foot section, with tools. Applications include supplying current to small traveling hoists, feeding motors of machines on which the motors are mounted on a traveling bed, and for portable tools used in various parts of a building or department.

♦ ♦ ♦

Centrifugal Pump—

The American Hard Rubber Co., 11 Mercer street, New York, offers their new type W A M pump for medium capacities up to 90 gallons per minute at 12-foot head. Every feature of the design has been worked out carefully on the basis that ability to handle acids and corrosive chemicals without difficulty is the first requisite. The casing of this pump, shown herewith, is made of acid-resisting hard rubber and is also heat and distortion resisting. It is mounted to the base by means of acid-resisting hard rubber covered casting which acts as a chamber to catch drip from



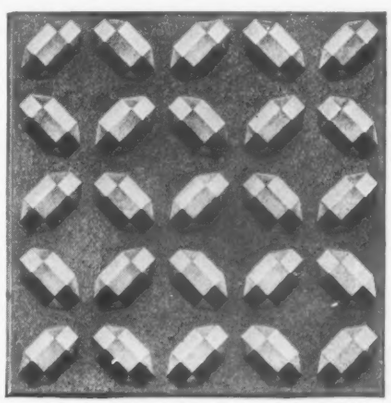
Centrifugal pump introduced by American Hard Rubber Co.

the stuffing box. By-pass is adjustable and cored into back casing. The motor shaft is especially extended, tapered and pinned into the pump shaft with all parts interchangeable.

♦ ♦ ♦

Anti-Skid Floor Plate—

Illinois Steel Co., 208 South La-Salle street, Chicago, recently brought out a new floor plate known as "Multigrip." The design has been developed by long experimentation to assure the highest degree of skid resistance from every angle. Other features of the new plate are its comfort under foot, for while it offers a sure tread there are no sharp proturberances. All lugs have



One-Half Actual Size

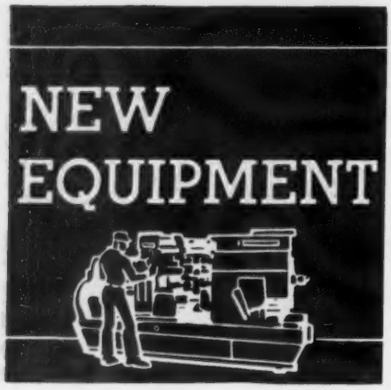
Illinois "Multigrip" floor plate effects resistance to skidding

a flattened top surface. The plate, shown herewith, may be cleaned readily and drains freely. There are no pockets in which water can accumulate. Its symmetrical design minimizes waste in cutting. A wide range of standard weights and sizes is available.

♦ ♦ ♦

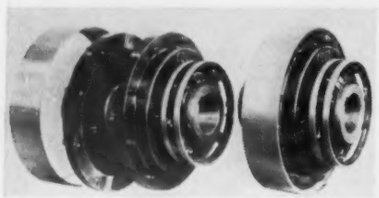
Positive Engagement Clutch—

Magnetic Mfg. Co., Milwaukee, is introducing a new positive engagement clutch. It will be noted in the accompanying illustration that the unit has teeth cut into the outer



periphery, through which it drives. High torques are developed within limited diameters, thus giving the unit application on high torque loads at high speeds. The engagement or disengagement should be made standing still or at low speeds, to prevent injury to the teeth.

The clutch is released through spring pressure. Quick engagement and disengagement is obtainable. A special outer shell is provided in the present instance to shield the teeth from grit, dirt, and magnetic dust getting on the same and interfering with engagement. Normally this shell would be unnecessary, it being used only where the clutch is installed in dirty, dusty locations. Special attention is called to the compact design and construction, carefully machined surfaces, and precision workmanship throughout. The clutch can be built in a number of different sizes, the unit shown herewith being approximately 20 inches in outer diameter.



Positive engagement clutch manufactured by Magnetic Mfg. Co.

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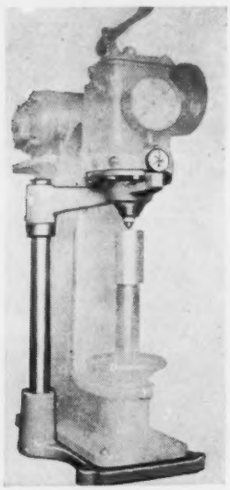
Attachment for Brinell Machine—

Detroit Testing Machine Co., Trumbull avenue, Detroit, recently has developed an attachment for a brinell machine which permits the operator to check hardness of parts or specimens without the use of a microscope. It is claimed that in most cases, spotting or grinding is unnecessary and good results are obtained on flat, round, or odd surfaces. Tolerance hands are set to the desired limit, and the operator notes whether or not the pointer stops between them.

The indicating instrument is supported independently, as shown in the accompanying illustration, and errors due to frame deflection or distortion are eliminated. Although developed primarily for use on power driven brinell machines, it may be used on hand operated types where a large number of similar pieces are to be tested.



Detroit attachment for brinell machine

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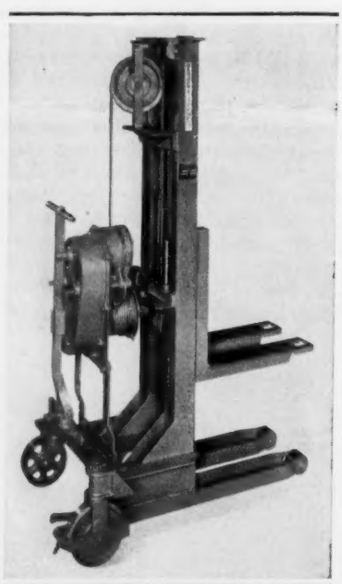
Tin Plate Elevator—

Barrett-Cravens Co., 3255 West Thirtieth street, Chicago, recently developed a hand-operated portable elevator designed to double and triple deck loads of tin plate weighing up to 4000 pounds. This unit, shown herewith, handles the tin plate on the new low 4-inch pallets or skids. Ball bearing floor wheels enable one man to maneuver loads, the manufacturer advises. The 2-speed hand hoist with all gears totally enclosed and running in oil provides easy operation. Overall height is 6 feet, 6 inches; lifting height 4 feet, six inches; length of lifting arms is 22 inches; width of base 30 inches; length of base 42 inches.

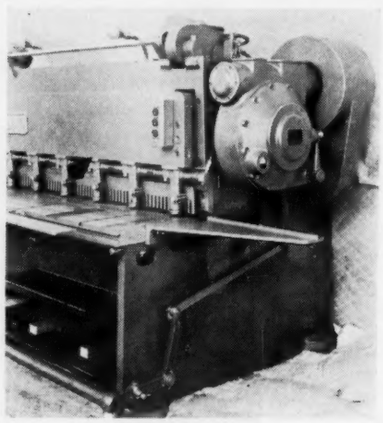


Barrett-Cravens designs new tin plate elevator

• • •

All Steel Shear—

Cincinnati Shaper Co., Hopple, Garrard and Elm, Cincinnati, recently added to its line of all steel shears a smaller series of machine than heretofore built, with capacity for shearing 10-gage mild steel in 8, 10 and 12-foot lengths. Typical features of this shear are the low rake of the knives, 5/16-inch to the foot; four-edge solid knives; and a speed of 60 strokes a minute.



Cincinnati all steel shear embodies slitting gage

Standard equipment includes knife guard; automatic lubricating system; side gage; front gage with extension arms; and ball bearing universal back gage, adjustable from one point with a dial reading to inches and sixty-fourths. This unit is regularly furnished with a 6-inch throat in the housings. Larger sizes are available with deeper throat for slitting wide sheets. The illustration herewith shows a slitting gage by which long sheets can be cut on a short shear in two or more operations as accurately as with a single cut. With this equipment it is impossible to see where the successive cuts start.

The illustration also shows the three button control to the motor, the third being an inching button for operating the shear when setting the knives. Electric lights furnish illumination of the table of the machine, but in addition are so placed and focussed that they afford a unique method of shearing to a scribed line on the sheet, all that is

necessary being to place this line on the bright edge of the light beam and avoid the usual difficulty of the operator sighting the position of the sheet from the end of the shear or from the top of the table.

♦ ♦ ♦

High Vacuum Pump—

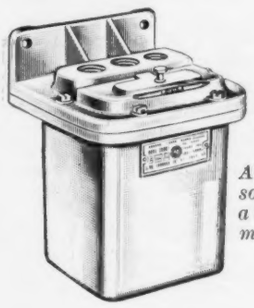
Worthington Pump & Machinery Corp., Worthington avenue, Harrison, N. J., has brought out a new high vacuum pump, shown herewith. The machine is a double-acting single pump of vertical design occupying minimum floor space. It can be furnished in either one or two-stages, depending upon the degree of vacuum required. All running parts operate in an air-tight and dust-proof case; adjustments are provided for wear the same as in large size expensive equipment. Features include feather valves, the same valves that are used in large compressors. These valves consist of strips of light ribbon steel, covering, when closed, a slightly smaller slot in the ground e seat. In opening, the valve lifts in the middle against a curved guard to permit the passage of air on either side of the strip.

Worthington vertical high vacuum pump equipped with feather valves

♦ ♦ ♦

Oil-Immersed Switches—

Allen-Bradley Co., 1311 South First street, Milwaukee, announces that protection against corrosive gases by oil immersion is afforded by the type H (explosion-proof) and type J (general application) enclosures recently developed for sizes 2 and 3 switches of its line of bulletin 709 solenoid-operated across-the-line starters. Starters equipped with these enclosures will take care of any polyphase motor requirements up to 15 horsepower, 110 volts; 30 horsepower, 220 volts; and 50 horsepower, 440-550 volts; as well as self-starting single-phase motors.



Allen - Bradley solenoid - operated, oil-immersed switch

The type H enclosure, besides protecting the starter contacts and mechanism against corrosive gases, also meets the underwriters' laboratories' requirements for equipment for class 1, group D hazardous gas locations. The hood and oil tank are of cast iron which is cadmium-plated as a protection against corrosion. A machined-surface seal is maintained between the tank and hood. The hood is tapped to receive conduit.

The type J starter is used in those installations where oil immersion is required only as a protection against corrosive gases. This equipment is not intended to meet explosion-proof requirements, such as is afforded by the type H enclosure.

♦ ♦ ♦

Potentiometer Controller—

The C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y., recently introduced an indicating potentiometer controller, shown herewith. A safety feature of this photoelectric controller is that when the lamp burns out power is shut off. Another safety arrangement is obtained by offsetting the galvanometer zero slightly so that if the thermocouple circuit breaks, the power is turned off.

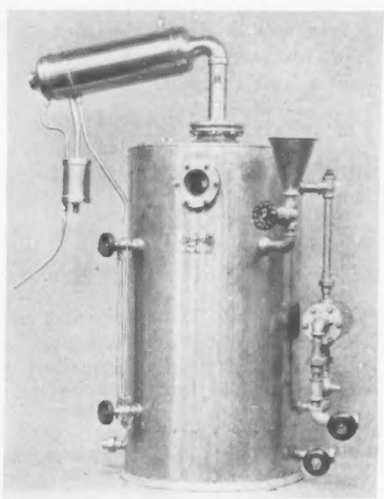
New Tagliabue indicating potentiometer controller

Circular scale and slide wire are 15 inches long and temperatures can be read to 0.1 per cent of the range. The scale appears through a glass window, and temperatures are indicated by a brilliant line of light on ground glass just above the circular edge. Furnaces, ovens, etc. can be controlled as close as variations in power or load will permit. The accuracy is sufficient for most laboratory temperature measurments.

♦ ♦ ♦

Solvent Recovery Still—

Barnstead Still & Sterilizer Co., Forest Hills, Boston, recently brought out a solvent recovery still which permits users of small or moderate amounts of cleaning solvents to recover them in their original purity and use them again and again. The unit, shown herewith, is designed for all types of industrial plants using numerous solvents such as lacquer solvents, degreasing solvents, etc. The solvents recovered are varied in use and nature, some of the more common being carbon tetrachloride, trichlorethylene, ethyl acetate, ether, alcohol, pentachlorethylene, acetone, toluol, benzol, naphtha and others. These new solvent stills are available for either continuous or batch operation, in a full range of capacities. They may be heated by steam, gas or electricity as desired.



Barnstead still for reclaiming used cleaning solvents

Issues 1935 Directory of Refractories Producers

Directory of the Refractories Industries; paper, 56 pages, 8½ x 11 inches; published by American Refractories institute, Pittsburgh; supplied by STEEL, Cleveland, for 50 cents postpaid; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This 1935 directory, the ninth edition, presents in convenient form information relative to brands, products and plants of members of the refractories industry in the United States. It should prove a valuable reference compilation to users of refractories, especially purchasing agents, metallurgists and engineers in industries which depend upon high temperatures in their plant production and operation. Listings are divided into three sections as follows: 1.—Alphabetical directory of brands; 2.—alphabetical directory of members of the refractories industry; and 3.—geographic location of refractories manufacturers' plants.

Map Shows Location of Refractories Plants

Map of Refractories Plants of the United States; available in three sizes, 22 x 17 inches, 44 x 34 inches and 66 x 48 inches; paper, cloth back, panel board back, or roll type; published by J. H. H. Muirhead, New York; supplied by STEEL, Cleveland, at prices ranging from $1 to $8.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This map is based on the list of refractories plants compiled by the American Refractories institute. (See preceding review of *Directory of the Refractories Industry.*) The map incorporates a key listing of all refractories plants, and cities, towns and villages having plants are placed to show the location and extent of the industry at a glance. So many plants are located in Ohio, Pennsylvania and New Jersey that a large-scale map from New York to Chicago is inserted.

Heavy Steel Plates Used In All-Welded Penstocks

(*Concluded from Page* 40)

outside fibers without any indication of fracture or tear.

After approval by the inspector, each 20-foot section was hauled from the fabricating site on a heavy-duty trailer and swung into position on the dam by overhead cableways.

When properly placed, the sections were welded together by the manual shielded arc process of welding. When all welding was completed the insides of the penstocks were sand blasted and given a coat of paint.

All welding was done by Chicago Bridge & Iron Works operators using automatic welding equipment, electrodes and manual welding machines supplied by Lincoln Electric Co., Cleveland.

New Trade Publications

WASHERS — Wallace Barnes Co., Bristol, Conn., has issued a leaflet calling attention to its large assortment of dies ready for production of washers of any size desired by a user.

TRUCKS—Barrett-Cravens Co., 3255 West Thirtieth street, Chicago, has issued a junior catalog, No. 235, covering briefly its line of materials handling equipment, with illustrations and standard specifications.

SPECIAL ALLOYS—Ampco Metal Inc., Milwaukee, has issued the fourteenth of its monthly series of data sheets, dealing with its grade 22. This is a hard metal, suited to special uses, especially dies.

CRANES—Bulletin No. 195 by the Whiting Corp., Harvey, Ill., describes its LH and LHE traveling cranes, hand or electric power. Illustrations and description are amplified by diagrams and specification tables.

SAFETY SWITCH—Electric Controller & Mfg. Co., Cleveland, has issued bulletin No. 1184 on its type A safety switches, quick-make and quick-break. It is illustrated, gives full descriptions and contains tables of specifications.

PACKING—Alexander Brothers Inc., 406 North Third street, Philadelphia, has issued a booklet on its leather packings, No. A-49. It is well illustrated and contains the standard price list adopted by the industry.

FINE FINISHES—A bulletin by the American Rolling Mill Co., Middletown, O., puts emphasis on the value of fine finish on metal as a factor in fabrication of fine products. A table of quick facts about Armco stainless steels is included.

STRIP STEEL—Acme Steel Co., 2840 Archer avenue, Chicago, in a current booklet covers its hot and cold-rolled strip steel for a wide variety of uses, from beer kegs and auto wheel rims to cutlery and cigaret cases. Its illustrative scheme is attractive.

TRUCKS—Yale & Towne Mfg. Co., Philadelphia, in two current bulletins describes its 3000 and 4000-pound single and multi-lift tilting fork trucks. In addition to description and illustrations it includes diagrams and specifications of both sizes.

PROPANE GAS—Phillips Petroleum Co., Philgas division, General Motors building, Detroit, in bulletin No. 47 describes its industrial propane gas service, its method of utilization, transportation and storage and its advantages as an industrial gas service.

ROTARY TOOLS—Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, in its bulletin SP-1876 covers its line of power vane rotary tools, drills, grinders, wrenches and other forms. It is illustrated and contains tables of specifications and detailed diagrams.

MAGNETIC PULLEYS, SEPARATORS—Bulletin No. 300 has been issued by the Magnetic Mfg. Co., Milwaukee, descriptive of a portion of its standard line of magnetic pulleys and magnetic pulley type separators. Specifications are given on all sizes from 12-inch upward.

CARBON MONOXIDE—Mine Safety Appliances Co., Pittsburgh, has prepared a booklet on the case against carbon monoxide and methods of combating it. It is an effort to impart knowledge of the widespread danger from this gas in industrial processes, with recommendations for detecting its presence before harm is done.

TURBO-COMPRESSORS — Spencer Turbine Co., Hartford, Conn., has issued a bulletin on the Spencer turbo-compressor, containing illustrations of its complete range of sizes. A feature is its midget compressor for individual mounting, a single stage line and its gas-tight turbos for acids and explosive gases.

INTERLOCKING FURNACE ARCH —Simplex Engineering Co., Washington, Pa., has issued a bulletin on its interlocking form of refractory brick for furnace arches, designed to retain its form and expedite replacements. Advantages of this form of furnace arch are described in the text, with appropriate illustrations to supplement.

MOTOR BRUSHES—Ohio Carbon Co., Cleveland, has issued a booklet devoted to carbon brushes for motors. It aims to help motor maintenance men solve the daily problem of correct commutation and current collection, with only as much theory as is necessary to understand what is happening in the windings of the machine. Diagrams aid in making the text clear.

CHAINS, SPROCKETS—C. O. Bartlett & Snow Co., Cleveland, in bulletin No. 74, lists and illustrates its line of standard types of detachable, pintle, ley-bushed and various other types of chain and attachments. Dimensions, weights, working loads and prices are presented. Information is given on shafting, collars, takeups, elevator buckets and gears.

FEED WATER REGULATORS — Bailey Meter Co., 1050 Ivanhoe road, Cleveland, has issued bulletin No. 83 on its feed water regulators of thermo-hydraulic type. Principles of operation are diagrammatically illustrated. Bailey regulating valves of tight seating and sleeve type are also described. Data are included on excess pressure valves and a tabulation of valve dimensions is presented.

ELECTRICAL EQUIPMENT—General Electric Co., Schenectady, N. Y., in bulletin No. 897E covers its air-cooled transformers for lighting and power service, with illustrations and wiring diagrams. A variety of applications of transformers is suggested and much technical information is given. In bulletin 1662A is described a trip-free air circuit breaker, with illustrations, diagrams and data tables.

REFRACTORIES — General Refractories Co., 106 South Sixteenth street, Philadelphia, has prepared a series of ten booklets on the company, its products and their fields. One is devoted to the company and its 20 plants, four to products, four to important fields and uses of refractories in these fields and one on high grade refractories from the South. Continuity of design is followed throughout.

Market Is Quieter; Steel Rate Down to 48

Basing Point Reports Add to Uncertainties Stemming Orders

THE MARKETS IN TABLOID

DEMAND *. . . Slower for all products, except tin plate.*

PRICES *. . . Scrap off sharply. Steel, pig iron steady.*

PRODUCTION *. . . Ingot output down moderately.*

SHIPMENTS *. . . Declining, including automotive.*

REFLECTING uncertainties injected into the industrial situation by recent developments in Washington, steelworks operations last week declined 2 points to 48 per cent, following the same trend at this time as in March each year since 1929.

Slowing in steel production at the end of the first quarter thus is not without precedent, but consumers are not making new commitments in the volume expected. Whether April develops the customary revival remains to be seen. At the moment, business seems to be dammed up, and sentiment in the market is weaker.

Contributing to this are the two government reports on the steel industry's basing point system, one by the federal trade commission unequivocally opposed to any except an f.o.b. mill price, the other by NRA urging group mill bases, each base to have a 50-mile radius. The presumption is some compromise to consumers' advantage will be worked out by June 16, final date for the renewal of codes. In the meantime, this is expected to be a factor in holding back all but most urgent steel demands.

Shipments and specifications for practically all finished steel products, except tin plate, are down at Pittsburgh, and in some other districts, while steel ingot output at Pittsburgh is scheduled for a reduction this week. Although a few lake sheet mills still are operating at capacity to complete quarterly contracts by March 31, the national average for sheet mills is down 5 points, to 55 per cent for galvanized sheets, and 75 per cent for the full finished grades.

With heavy material inventories, automobile manufacturers last week made 97,000 cars, 11,000 more than in the preceding week. Ford is attaining its March program of 160,000, but for April has scheduled only 152,000. Any reduction by Ford is expected to be made up by increases by Chevrolet and others. The industry has set another million cars as its mark for second quarter.

Automotive plant expansions feature structural shape awards, which for the week totaled 10,179 tons. Ford has placed 1325 tons for a plate glass plant in Detroit; Chevrolet 380 tons for a gear and axle plant, and Chrysler is taking bids on 350 tons for Dodge truck addition. National Steel Corp. opens bids March 18 on 10,300 tons of shapes for a Detroit strip mill building. McClintic-Marshall Corp., Bethlehem, Pa., is low for 33,000 tons of steel for the Triboro, New York, bridge, this and 20,000 tons additional to be placed soon—a happy *finale* to the New York-federal aid feud. The navy will open bids March 20 on 3735 tons or armor plate.

Including 23,500 tons of rails awarded by the New York Central, rail purchases so far this year amount to 89,177 tons, or 46 per cent of that in the comparable period last year. New York Central also ordered 9000 tons of accessories. Union Pacific is to allocate 19,000 tons of rails soon, and Chicago & North Western announces it will buy 25,000 tons. Burlington has budgeted for 750 freight cars.

Coke and coal shipments in Pennsylvania are the heaviest in several years due to strike threats in the bituminous coal fields. Second quarter pig iron bookings by lake furnaces are 40 per cent heavier than they were three months ago for the first quarter. Overflowing scrap supplies, especially from the Detroit district, have further weakened the market, STEEL's scrap price composite being off 33 cents to $10.71.

Steelworks operations last week in the Chicago district dropped 4 points to 51 per cent: Cleveland 2 to 72; New England 8 to 53; Detroit 6 to 88; eastern Pennsylvania ½-point to 28. Youngstown advanced 3 to 58. Buffalo was unchanged at 38; Wheeling 92; Pittsburgh 38; Birmingham 55½.

STEEL's iron and steel price composite is down 1 cent to $32.38; finished steel unchanged at $54.

COMPOSITE MARKET AVERAGES

	March 16	March 9	March 2	One Month Ago Feb., 1935	Three Months Ago Dec., 1934	One Year Ago March, 1934	Five Years Ago March, 1930
Iron and Steel	$32.38	$32.39	$32.42	$32.54	$32.39	$31.38	$34.79
Finished Steel	54.00	54.00	54.00	54.00	54.00	51.10	54.88
Steelworks Scrap	10.71	11.04	11.15	11.66	11.02	12.30	14.52

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	March 16, 1935	Feb., 1935	Dec., 1934	Mar., 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.75c
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00

Pig Iron

	March 16, 1935	Feb., 1935	Dec., 1934	Mar., 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	18.76
No. 2, foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2, foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	19.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	24.04	24.04	24.04	23.54
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.38

Scrap

Heavy melting steel, Pittsburgh	$12.25	$13.25	$12.95	$14.35
Heavy melt. steel, No. 2, east. Pa.	9.25	10.12	9.30	9.70
Heavy melting steel, Chicago	10.25	11.65	10.55	12.00
Rails for rolling, Chicago	11.75	12.55	11.65	12.75
Railroad steel specialties, Chicago	11.75	12.50	11.90	13.00

Coke

Connellsville, furnace, ovens	$3.60	$ 3.60	$3.60	$3.35
Connellsville, foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.18c
Philadelphia, del	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, delivered	2.20c
Buffalo, delivered	2.03½c
Chicago or Gary	1.85c
Cleveland, del.	1.98½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, delivered	2.18½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	1.98½c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.09c
Boston, delivered	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

IRON

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined..	2.75-7.50c

REINFORCING

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve. 100 lb. keg

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer..	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

S.A.E.	Alloy Diff.	S.A.E.,	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.....0.50
4600 0.20 to 0.30 Mo. 1.25 1.75 Ni. 1.05
5100 0.80-1.10 Cr 0.45
5100 Cr. spring .....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van.....1.50
Carbon Van. 0.95
9250....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23½-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base,	2.00c
Detroit, delivered	2.05c
Phila., delivered..	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6 smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts,	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½x6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in. small	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland..	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras..	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

⅛, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts, over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B.
Stnd. fitgs., Birm. base....$100.00

Semifinished Steel

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown..	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point....	1.70c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville, fur.	$3.60- 3.85
Connellsville, fdry...	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry....	4.45- 5.25
Wise county fur.....	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del..	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Po.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del...	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmgham.	21.30	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

*Washed gravel, duty paid, tide net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.89

†Carloads, Quan. diff. apply

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Mar. 9	9.00	9.12½	7.50	47.20	46.95	3.55	3.40	3.90	*19.00	14.50	35.00
Mar. 11	9.00	9.12½	7.50	46.95	46.70	3.55	3.40	3.90	*19.00	14.50	35.00
Mar. 12	9.00	9.12½	7.50	46.75	46.50	3.55	3.40	3.90	*19.00	14.50	35.00
Mar. 13	9.00	9.12½	7.50	47.12½	46.87½	3.55	3.40	3.90	*19.00	14.50	35.00
Mar. 14	9.00	9.12½	7.50	47.20	46.90	3.55	3.40	3.90	*19.00	14.50	35.00
Mar. 15	9.00	9.12½	7.60	47.10	46.70	3.55	3.40	3.90	*19.00	14.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c *Conn. copper.*

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.25- 4.50
Cleveland	5.00- 5.50
Chicago	4.37½-4.62½
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	5.75- 6.00
Chicago, No. 1	5.37½-5.62½
Cleveland	5.75- 6.00
St. Louis	5.25- 5.50
Composition Brass Borings	
New York	3.75- 4.00
Light Copper	
New York	4.50- 4.75
Chicago	4.12½-4.37½
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.12½-2.37½
Cleveland	2.50- 2.75
Lead	
New York	2.70- 2.80
Cleveland	2.50- 2.75
Chicago	2.50- 2.75
St. Louis	2.65- 2.75
Zinc	
New York	1.87½-2.12½
Cleveland	2.00- 2.50
St. Louis	2.25- 2.40
Aluminum	
Borings, Cleveland	7.25- 8.00
Mixed, cast, Clev.	11.50-12.00
Mixed, cast, St. L.	12.75-13.00
Clips, soft, Clev.	14.00-14.50

SECONDARY METALS

Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	16.00-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00- 9.50
Boston, dock, expt...	8.75- 9.00
Boston, domestic	7.25- 7.50
Buffalo, No. 1	11.00-11.25
Buffalo, No. 2	9.50-10.00
Chicago, No. 1	10.00-10.50
Cleveland, No. 1	9.75-10.25
Cleveland, No. 2	9.25- 9.75
Detroit, No. 1	8.00- 8.50
Detroit, No. 2	7.00- 7.50
Eastern Pa., No. 1..	10.00-10.50
Eastern Pa., No. 2..	9.00- 9.50
Federal, Ill.	7.75- 8.25
Granite City, R. R...	8.50- 9.00
Granite City, No. 2..	7.25- 7.75
N. Y., deal. No. 2....	7.75- 8.00
N. Y., deal. barge....	9.25- 9.50
Pittsburgh, No. 1....	12.00- 12.50
St. Louis	8.00- 8.50
Valleys, No. 1	12.50-12.75

COMPRESSED SHEETS

Buffalo, dealers	9.50-10.00
Chicago, factory	9.50-10.00
Chicago, dealer	9.00- 9.50
Cleveland	9.75-10.25
Detroit	8.00- 8.50
E. Pa., new mat.	10.00
Pittsburgh	11.50-12.00
St. Louis	7.00- 7.25
Valleys	11.75-12.00

BUNDLED SHEETS

Buffalo	8.00- 8.50
Cincinnati, del.	6.00- 6.50
Cleveland	7.50- 8.00
Pittsburgh	10.50-11.00
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	6.00- 6.50
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	12.50-13.00
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	11.50-12.00
Detroit	11.00-11.50
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft. & less	12.50-13.00

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	10.00-10.50
Pittsburgh	12.50-13.00
St. Louis	10.50-11.00

STOVE PLATE

Birmingham	6.00- 6.50
Boston, dealers	3.75- 4.00
Buffalo	9.25- 9.75
Chicago, net	6.50- 7.00
Cincinnati, dealers..	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	13.25-13.75
Chicago, springs	11.50-12.00
Eastern Pa.	14.00-14.50
Pittsburgh	14.00-14.50
St. Louis	10.50-11.00

ANGLE BARS—STEEL

Chicago	11.50-12.00
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	11.50-12.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.25-13.75
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops..	14.00-14.50
Pittsburgh, billet, bloom crops	14.00-14.50
Pittsburgh, sheet bar crops	13.00-13.50

FROGS, SWITCHES

Chicago	10.50-11.00
St. Louis, cut	10.50-11.00

SHOVELING STEEL

Chicago	10.00-10.50
Federal, Ill.	7.75- 8.25
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	9.00- 9.50
Buffalo, No. 2	11.00-11.50
Chicago, No. 1, net..	9.00- 9.50
Chicago, No. 2	10.00-10.50
Cincinnati, No. 2....	8.00- 8.50
Eastern Pa.	11.00-11.50
N. Y., No. 1, deal....	7.50- 8.00
St. Louis, No. 1	7.00- 7.50
St. Louis, No. 2	8.50- 9.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.50
New York, dealers..	3.50- 4.00

BUSHELING

Buffalo, No. 1	9.50-10.00
Chicago, No. 1	9.00- 9.50
Cinci., No. 1, deal....	6.00- 6.50
Cincinnati, No. 2....	2.75- 3.25
Cleveland, No. 2	7.00- 7.50
Detroit, No. 1, new..	7.00- 7.50
Valleys, new, No. 1..	11.50-12.00

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	2.00
Buffalo	6.00- 6.50
Chicago	5.50- 6.00
Cincinnati, dealers..	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.00- 4.50
Eastern Pa.	6.00- 6.50
New York, dealers..	2.25- 2.75
Pittsburgh	7.00- 7.50
St. Louis	3.50- 4.00
Valleys	8.00- 8.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Cincinnati, dealers..	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	5.25- 5.75
Eastern Pa.	5.00
New York, dealers..	1.50- 1.75
Pittsburgh	7.00- 8.00

CAST IRON BORINGS

Birmingham, plain..	4.50- 5.00
Boston, chemical....	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Chicago	5.50- 6.00
Cincinnati, dealers..	3.50- 4.00
Cleveland	7.00- 7.50
Detroit	5.25- 5.75
E. Pa., chemical....	11.00-12.00
New York, dealers..	1.50- 1.75
Pittsburgh	7.00- 8.00
St. Louis	3.50- 4.00

PIPE AND FLUES

Cincinnati, dealers..	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.50- 9.00
New York, dealers..	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	9.50-10.00
Cleveland	8.00- 8.50
Detroit	7.00- 7.50

FORGE SCRAP

Boston, dealers	5.50- 6.00
Chicago, heavy	11.00-11.50
Eastern Pa.	10.00

ARCH BARS, TRANSOMS

St. Louis	11.00-11.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur....	10.00-10.50
Cleveland	7.00- 7.50
Eastern Pa.	9.50
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.50-13.00
Boston, ship. point..	10.00-10.50
Buffalo	13.25-13.75
Chicago, net	14.00-14.50
Eastern Pa.	16.50-17.00
St. Louis	13.00-13.50

SHAFTING

Boston, ship. point..	12.25-12.50
Eastern Pa.	16.50-17.00
New York, dealers..	12.50-13.00
St. Louis	11.50-12.00

CAR WHEELS

Birmingham	9.00- 9.50
Boston, iron deal.	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	13.00-13.50
Chicago, iron	11.00-11.50
Chicago, rolled steel	11.50-12.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron....	10.50-11.00
Eastern Pa., steel....	14.50-15.00
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.50- 8.00
St. Louis, steel	10.50-11.00

NO. 1 CAST SCRAP

Birmingham	9.50-10.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.50-11.00
Buffalo, mach.	11.50-12.00
Chicago, agri. net....	8.00- 8.50
Chicago, auto	9.50-10.00
Chicago, mach. net..	9.50-10.00
Chicago, railr'd net	8.50- 9.00
Cinci., mach. cup....	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.00
Pittsburgh, cupola..	12.50-13.00
San Francisco, del..	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach..	9.50-10.00

HEAVY CAST

Boston, del.	5.50- 5.75
Buffalo, break.	9.00- 9.50
Cleveland, break.	8.50- 9.00
Detroit, auto net	10.50
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.50
N. Y. break. deal....	5.75- 6.25
Pittsburgh	11.50-12.00

MALLEABLE

Boston, consum.	10.00-10.50
Buffalo	12.50-13.00
Chicago, R. R.	13.25-13.75
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	11.00-11.50
St. Louis, R. R.	10.00-10.50
Eastern Pa., R. R....	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	8.00- 8.50
Buffalo	11.00-11.50
Chicago	11.50-12.00
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.75-11.25

LOCOMOTIVE TIRES

Chicago (cut)	11.50-12.00
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS

Buffalo	13.25-13.75
Chicago	12.50-13.00
Eastern Pa.	14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbes.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.,	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, 3/16-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.45c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS

Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅞-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
Milwaukee	3.41c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c

COLD. FIN. STEEL

Baltimore (c)	3.71c
Boston	3.85c-4.00c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
Milwaukee	3.61c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle(f) (d)	4.75c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs. extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 14

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$14.87 3 2 6	$15.12	1 16 0
Basic bessemer	13.10 2 15 0*	13.43	1 12 0
Hematite, Phos. .03-.05	14.87 3 2 6	.....	.....
SEMIFINISHED STEEL			
Billets	$26.18 5 10 0	$19.72	2 7 0
Wire rods, No. 5 gage	37.13 7 16 0	37.78	4 10 0
FINISHED STEEL			
Standard rails	$36.89 7 15 0	$46.17	5 10 0
Merchant bars	1.59c 7 10 0	1.19c to 1.24c	3 2 6 to 3 5 0
Structural shapes	1.56c 7 7 6	1.17c	3 1 6
Plates, †¼ in. or 5 mm	1.70c 8 0 0	1.57c	4 2 6
Sheets, black, 24 gage or 0.5 mm	1.96c 9 5 0	2.21c	5 16 0
Sheets, gal., 24 gage, corr.	2.39c 11 5 0	2.46c	6 10 0
Bands and strips	1.80c 8 10 0	1.52c	4 0 0
Plain wire, base	1.96c 9 5 0	2.03c	5 7 6
Galvanized wire, base	2.39c 11 5 0	2.38c to 2.41c	6 5 6 to 6 7 6
Wire nails, base	2.54c 12 0 0	2.19c	5 15 0
Tin plate, box 108 lbs.	$ 4.28 1 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	L s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$16.07	3 7 6(a)	$17.16	260	$14.48	310	$25.39	63
Basic bessemer pig iron	16.07	3 7 6(a)*	12.21	185	13.30	285	28.01	(b) 69.50
Furnace coke	4.05	0 17 0	7.92	120	5.14	110	7.66	19
Billets	26.18	5 10 0	28.38	430	20.55	440	38.89	96.50
Standard rails	1.75c	8 5 0	2.08c	694	2.31c	1,100	2.38c	132
Merchant bars	1.82c	8 12 0	1.68c	560	1.16c	550	1.98c	110
Structural shapes	1.86c	8 15 0	1.65c	550	1.16c	550	1.94c	107.50
Plates, †¼-in. or 5 mm	1.92c	9 1 3	2.10c	700	1.47c	700	2.29c	127
Sheets, black	2.23c	10 10 0§	2.55c	850‡	1.63c	775‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.76c	13 0 0	4.05c	1,350	3.15c	1,500	6.66c	370
Plain wire	1.96c	9 5 0	3.39c	1,130	2.31c	1,100	3.11c	173
Bands and strips	1.98c	9 7 0	1.95c	650	1.47c	700	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite †† Close annealed

**Gold pound sterling carries a premium of 72.35 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh — Little improvement has occurred the past week in either carbon or alloy steel bar demand and absence of rush delivery from automobile manufacturers is noticeable. Without change, 1.80c, Pittsburgh, base on hot-rolled carbon bars and 2.45c, Pittsburgh, base on hot-rolled alloy bars are steady. The cold drawing trade is a fair buyer of hot-rolled bars and manufacturers of small agricultural implements are a bright spot.

Cleveland — Merchant bar shipments are falling below the February average, automobile manufacturers and forge shops having acquired fairly large stocks, and production here continues at the reduced rate of 36 per cent. Builders of road machinery have placed some substantial orders. Miscellaneous railroad specifications are light.

Chicago—Except for a lag in steel bar demand from the automotive industry, incoming business recently has been fairly steady. The upward trend in requirements by manufacturers of tractors and other farm implements continues, while needs of miscellaneous consumers are well maintained. Business for second quarter delivery is slow though mills regard this as not unusual in view of prompt delivery which they have been able to give during the current quarter.

Boston—With leading commercial bar consumers buying little, volume is barely maintained. Some decline is noted in forging bar specifications. Cold-finished material demand holds well and the Connecticut mill continues moderately active.

New York—Erie Forge Co., Erie, Pa., is low on steel forgings for the Boston, Philadelphia and Norfolk, Va., navy yards at $16,019.55, bids March 8, schedule 4321, bureau of supplies and accounts, navy department, Washington.

Steel bar buying is listless but several railroads are expected in the market soon for second quarter requirements.

Philadelphia — Commercial steel bars are featured by good demand from cold drawers, but in general trading is light, reflecting particularly absence of specifications from the railroads and bolt and nut manufacturers. Jobbers, who recently placed some fair specifications, are now largely out of the market. Prices are 1.80c, Pittsburgh, or 2.09c, Philadelphia.

Republic Steel Corp., Youngstown, O., has appointed Atlas Supply Co. Inc., 35 Woodward avenue, Brooklyn, N. Y., warehouse distributor of toncan iron sheets. A complete stock will be carried.

Plates

Plate Prices, Page 70

Pittsburgh—Ohio River Co., Cincinnati, has issued plans for a 245-foot towboat which it expects to buy. The boat will have ⅜-inch bottom plates and will require approximately 320 tons of steel plates and shapes. Bids are to be taken March 20 by the Pittsburgh engineers on repairs to a government-owned towboat and bids may be asked soon by the same engineers' office on repairs to seven dump scows. Private barge inquiry is still promising with a Charleston, W. Va., buyer and a Chicago buyer both among the more actively mentioned inquirers. However, the Chicago buyer may use all-rail transportation exclusively as regards a coal hauling project. Treadwell Construction Co., Midland, Pa., has been awarded 500 feet of 20-inch steel suction pipe by the Philadelphia engineers, to be fabricated of plates into 20-foot lengths. Plates are steady on the basis of 1.80c, Pittsburgh, for immediate shipment and second quarter.

Cleveland—Orders for plates have been increasing and include more diverse uses, but tonnage is light. Considerable demand is noted for plates of special analysis. Manufacturers of machinery and high-pressure vessels are active buyers, while relatively few orders are received from boiler shops. The Wheeling & Lake Erie railroad has purchased 200 tons of plates, shapes and bars, mainly plates, for building eight switch locomotives in its own shops. Lorain, O., will build a 150,000-gallon elevated water tank, requiring 600 tons of plates and shapes. The Cleveland plate mill is operating at 45 per cent.

Chicago—Only a small improvement in plate requirements of railroads and equipment builders is in early prospect, based on pending and prospective orders for freight cars and locomotives and on plans of railroads for equipment repairs. Demand from miscellaneous consumers has improved slightly.

Boston—Character of plate buying is unchanged with few tonnage projects pending. Small lot purchasing, however, continues fairly active, covering a wide range, with industrial demand holding well. Aggregate volume, however, is not large.

New York—Demand for plates continues light with the basing point controversy a further damper. Award of fabricated steel pipe for the city is still being deferred. Tank and railroad buying is small.

Philadelphia—A drop in plate specifications is noted, notwithstanding that fabricators look for improvement in tank work as spring advances. At the moment, few of these jobs appear active. No action has been taken in the distribution of steel for the Erie ferryboat, to be built by the Sun Shipbuilding Co., Chester, Pa. The rebuilding of a dredge by the American Dredging Co., this city will require few plates, it is understood; most of the rebuilding will be done on machinery, for which some forgings will be required. Plates are 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia.

Seattle—Demand is increasing with pulp mill and brewing plants enlarging facilities. In addition to public works, service station construction and general repair work are taking larger tonnages of light gage material. The largest project pending totals 10,800 tons for 18-foot diameter steel penstocks for the Coulee, Wash., dam project. There will be 18 cylinders of welded plate, each 300 feet in length, nine for each side of the river.

San Francisco—Plate business has shown little improvement. Pacific Bridge Co., Portland, Oreg., is low bidder on the general contract for 1300 tons for the Hetch Hetchy bay-crossing pipe line, San Francisco. Four tanks for the Petrol Corp., Los Angeles, will require 300 tons or more.

Contracts Placed

842 tons, 10 gage blue annealed sheets, Green river, pipe line, Tacoma, Wash., subcontract to Columbia Steel Co., San Francisco; awarded by general contractor, American Concrete Pipe Co., Tacoma, Wash.

610 tons, three 55,000-barrel tanks, Royal Petroleum Co., Sewaren, N. J., to Chicago Bridge & Iron Works, Chicago.

175 tons, hull plate steel, bureau of supplies and accounts, navy department, Washington, delivery Norfolk, Va., to Illinois Steel Co., Chicago, bids Feb. 26; same company also awarded corrosion-resisting steel, including plates, Norfolk, Va., at $14,237.31, delivered, bids Feb. 26, schedules 4329 and 4344, lot 640.

100 tons, standpipe, Northboro, Mass., to Chicago Bridge & Iron Works, Chicago.

Unstated tonnage, welded oil barge for United States engineer, Charleston, S. C., to Ingalls Iron Works, Birmingham, Ala., at $11,000.

Contracts Pending

10,800 tons, 18-foot diameter welded plate penstocks, 18 feet diameter, for Coulee, Wash., power projects.

3735 tons, armor plate, bureau of ordnance, navy department, Washington, bids March 20, schedule 165.

ANNOUNCING

THE NEW
P&H
50 AMP. WELDER
FOR LIGHT GAUGE METALS

Here's a unit that will deliver as low as 10 amps. at the arc without the use of external reactor, resistor or stabilizer.

The stable arc of this small machine enables you to weld quickly and effectively on materials as light as 24 gauge—ferrous and non-ferrous metals can be welded with greater efficiency. It has the single, simplified current control which distinguishes the larger P&H-Hansen machines.

Vertical design saves floor space. May be fitted with lifting bail for easy handling around the shop. Ask for complete details.

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H HANSEN ARC WELDERS

1800 tons, 42 to 58-inch welded steel pipe or reinforced concrete pipe, third unit, Green river pipe line, Tacoma, Wash.; bids about April 1.

1300 tons, 54-inch, welded steel pipe, Hetch Hetchy bay-crossing pipe line, San Francisco; Pacific Bridge Co., Portland, Oreg., low on general contract.

600 tons, elevated water tank, Lorain, O.; city council acting on legislation.

320 tons, one 245-foot towboat, for Ohio River Co., Cincinnati.

300 tons, four storage tanks, 85,000-barrel combined capacity, Petrol Corp., Los Angeles; bids soon.

133 tons, spillway dam, Fort Peck, Mont; bids April 3.

110 tons, standpipe, Shoemakersville, Pa.; bids opened March 15.

Unstated tonnage, 2210 feet 54-inch hammer welded, electrically welded or lock joint pipe, ½-inch plates, intake pipe, Niagara Falls, N. Y., bids March 21 to city manager; alternate on concrete lined tunnel.

Unstated tonnage, 50 lengths, each 12 feet, 30-inch steel shore pipe; bids March 19, United States engineer, Wilmington, N. C.

Unstated tonnage, 280 lengths, 28-inch inside diameter land pipe, one-inch plates, and 560 connecting links, United States engineer, Kansas City, Mo.; McClintic-Marshall Corp., Bethlehem, Pa., low at $18,256; schedule 209.

Unstated tonnage, 500,000-gallon elevated water tank, Marion, Wis.; Pittsburgh-Des Moines Steel Co., Pittsburgh low bidder.

Transportation

Track Material Prices, Page 71

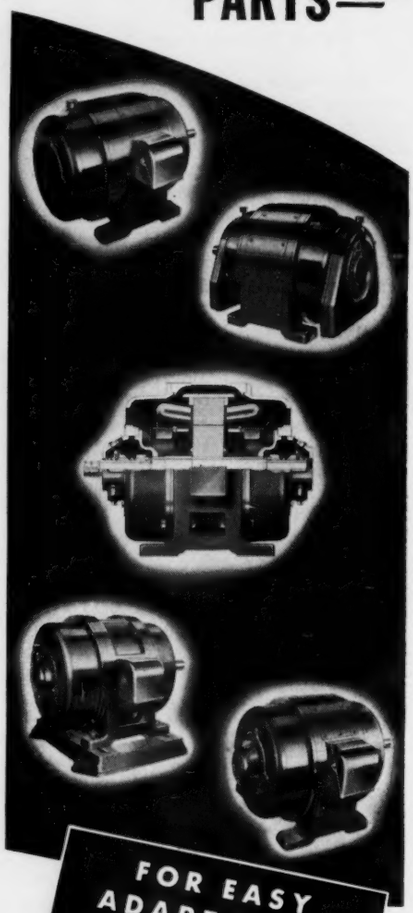
New York Central has awarded 10,665 tons of standard steel rails to Illinois Steel Co., Chicago, and 9335 tons to Bethlehem Steel Co., Bethlehem, Pa. In addition it awarded 3500 tons to Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., for use on its Canadian lines. Rail accessories totaling about 9000 tons were divided among 19 manufacturers.

Chicago & North Western plans to buy 25,000 tons of rails, Union Pacific 19,000 tons and Chicago Great Western 5000 tons.

Gulf, Mobile & Northern, Mobile, Ala., has applied for a government loan of $212,500 for the purchase of about 5000 tons of 90-pound rails and sufficient fastenings, to replace 80-pound rails now in service.

Pennsylvania railroad will hold a Clayton act opening, March 19, on its regular requirements for second quarter, including plates, shapes, bars, sheets, strip, billets, wheels and axles, piston heads, track spikes, tie plates, joint bars, steel tires, tool and high speed steel, steel pipe, boiler tubes, reinforcing bars, nails, piling, floor plate and pig iron. Norfolk & Western will also have a Clayton act opening this week on 4500 tons of plates, shapes, bars and nails. Fruit Growers Express will open bids this week on its quarterly requirements of plates, shapes, bars and nails. The

INTERCHANGEABLE PARTS—



FOR EASY ADAPTATION TO DIFFERENT SERVICE REQUIREMENTS

Here's convertibility in standard AC motors at no extra cost. Enclosed fan cooled, splash proof, or totally enclosed service requirements can be filled with a standard open type unit. Either Squirrel Cage or Slip Ring types. It means extra motor value from the day it is installed. You can correct misapplications without delay. You can avoid costly replacements. Bulletin HM-1 gives you complete details. Ask for it.

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H CONVERTIBLE MOTORS

Delaware river bridge commission, Philadelphia, has opened bids on 26 passenger cars for electric service.

Air conditioning activities include 235 additional passenger cars by the New York Central, bringing its total to 537 thus equipped; 75 cars by the Chicago, Burlington & Quincy; 135 by Chicago & North Western; 30 cars by Chicago & Eastern Illinois.

Chicago, Burlington & Quincy has included in its budget 500 coal cars, 250 hoppers, two passenger coaches, 39 light inspection motor cars, three superintendent inspection motor cars and a Pacific type locomotive. Delivery of the two streamlined trains ordered in August, 1934, from Edward G. Budd Mfg. Co., Philadelphia, by the Chicago, Burlington & Quincy will be made in a short time. These trains are practically duplicates of the original Zephyr bought by this road.

Chicago & North Western is seeking a government loan of $1,500,000 for making repairs to rolling stock.

Locomotives Placed

Wheeling & Lake Erie, Cleveland; eight switch locomotives to own shops, Brewster, O.

Rail Orders Placed

New York Central, 23,500 tons, 10,665 tons to Illinois Steel Co., Chicago, 9335 tons to Bethlehem Steel Co., Bethlehem, Pa., 3500 tons to Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont.; about 9000 tons accessories divided among 19 suppliers.

Car Orders Pending

Chicago, Burlington & Quincy, Chicago, 500 composite coal cars, 250 hoppers, 39 light inspection motor cars, two deluxe day coaches, three superintendent motor cars; budget provision made.

United States engineer, Rock Island, Ill., one flat car, assembled complete bids March 29, schedule 173.

Locomotives Pending

Bureau of supplies and accounts, navy department, Washington, two switching locomotives for Hingham, Mass., and Portsmouth, N. H., Davenport-Besler Co., Davenport, Iowa, low.

Chicago, Burlington & Quincy, Chicago, one Pacific type locomotive; budget provision made.

Louisiana & Arkansas, Shreveport, La., four Mikado type locomotives; bids asked.

Rail Orders Pending

Chicago Great Western, Chicago, 5000 tons; bids asked.

Chicago & North Western, 25,000 tons.

Gulf, Mobile & Northern, 5000 tons 90-pound rails and fastenings; government loan asked.

Union Pacific, 19,000 tons.

Buses Placed

Comprehensive Omnibus Corp., New York, fifty-six 30-passenger transit type, to Mack-International Motor Truck Corp., New York.

Community Traction Co., Toledo, O., eight 20-21-passenger transit type, to Mack-International Motor Truck Corp., New York.

Israel Richmond, Trenton, N. J., two 20-passenger transit type, to Mack-International Motor Truck Corp., New York.

Union Transportation Co., Tulsa, Okla., ten 30-passenger transit type, to Mack-International Motor Truck Corp., New York.

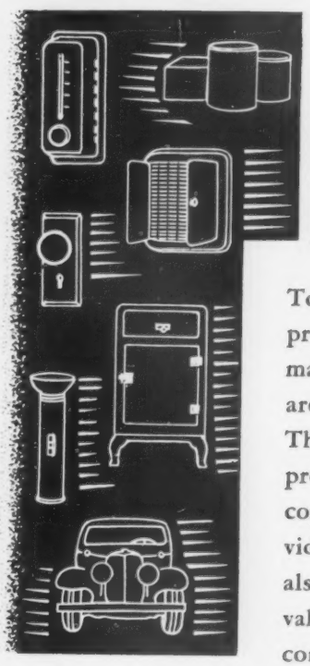
For cast irons subject to temperatures above 1600 degrees Fahr., one authority claims that between 12 and 16 per cent chromium is necessary to prevent growth.

Cold Finished

Cold Finished Prices, Page 71

Pittsburgh — Though automobile manufacturers are less insistent for rush delivery of cold-finished steel bars, their specifications, and a fair volume from makers of light agricultural implements have been suffi-

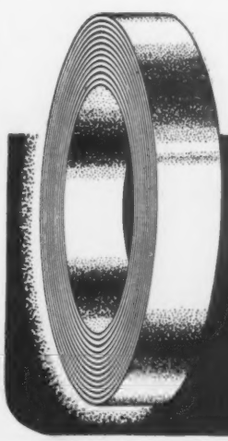
FINER APPEARANCE



that adds to saleability

To meet the demands of today for greater product quality and sales appeal at low cost, manufacturers in ever increasing numbers are now specifying specialized production Thomastrip for the fabrication of their products . . . Thomastrip electro zinc, copper and cadmium coatings, not only provide finer appealing appearance, but they also add materially to durable quality and value . . . Thomastrip advantages of fast, continuous production, gauge and size accuracy, temper uniformity and non-porous, peel-proof coatings have been the quick solution to many sales and production problems. A Thomas representative will gladly cooperate with you.

Test Thomastrip for your product. Send for test samples. Specify gauge, width, temper and coat desired.



THE THOMAS STEEL CO. · WARREN, O.

SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

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STRIP COLD ROLLED STEEL

BRIGHT FINISH · ZINC COATED

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cient to maintain orders at a rate comparable to the first half of February. Some producing interests report an increase of as much as 10 per cent in March bookings. New England textile machinery manufacturers are slow buyers. The 2.10c, Pittsburgh, base, with observance of other equalization charges, is continuing.

Sheets

Sheet Prices, Page 70

Pittsburgh—For the first time since the first week in January, sheet mill operations last week showed a decline. This was noted not only in full-finished sheets, but in galvanized, hot-rolled galvanized, and among the jobbing mills. Full-finished sheet production dropped about 5 points to 75 per cent for the industry, whereas, hot-rolled was off to about 65 per cent, galvanized to 55 per cent, and jobbing mills to about 55 per cent. Practically no second quarter contracts for sheets have been negotiated. That there will be an increase in the price of sheet seconds of $2 to $8 a ton April 1 seems more definite. Some boiler manufacturers have been buying cold-rolled seconds at less than ordinary hot-rolled boiler plate material. Prices on all grades of prime sheets are unchanged.

Cleveland—Production and shipments continue at a high level, sheet mills here and in an adjacent district operating at capacity. Automobile production for the first quarter is nearing the million-car mark, and another million is scheduled for the second quarter. Ford is attaining its March schedule of 166,000 units, and Chevrolet 113,600. Sheet mills are practically booked up for April. Miscellaneous manufacturing requirements are steady, but orders from barrelmakers are slowing up. Ohio has distributed 750 tons of No. 24 gage sheets for license plates, using a lighter stock than last year, and thereby reducing its order by 450 tons.

Chicago—Sheets predominate in what new business is being received for second quarter delivery. This situation arises from the desire of consumers to be protected on April shipments in view of difficulties encountered in giving prompt delivery during the past several weeks. Automotive requirements are well maintained, while little tendency is noted for consumption elsewhere to moderate. The outlook for a maintenance of sheet mill operations around present levels during the early part of next quarter is favorable.

Boston—Sheet demand is generally unchanged, with cold-finished fairly active. A slight improvement has developed in demand for galvanized. Mills are doing better on deliveries.

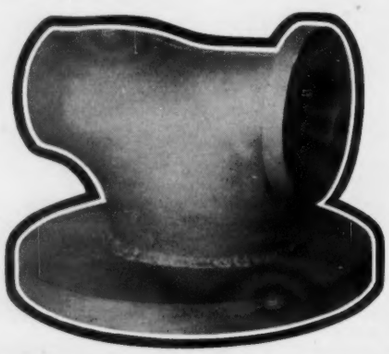
New York—While fair demand for sheets continues, business is less active. Less concern is being shown by consumers of cold-finished sheets over positions on mill schedules, although a number of leading buyers assured themselves at the beginning of the month of satisfactory positions. Current specifications are lighter. Prices are steady.

Philadelphia—Activity in the sheet market has subsided. Sellers of cold-finished sheets report their production is now well covered for April and, in the case of some, well into May. Deliveries on hot-rolled sheets are easier. Two or three leading sellers are now offering two to three weeks deliveries on the heavier gages and three to four weeks on the lighter, except on widths beyond 40 inches on which an additional week is usually required.

Cincinnati—Sheet mills will operate at capacity on some specifications to complete deliveries on first quarter contracts by March 31. Demand from jobbers and makers of refrigerators, stoves and barrels has improved.

St. Louis—Business is holding up fairly well, with further expansion in certain grades. Demand is widely diversified.

Birmingham, Ala.—Demand for sheets in the South continues strong, especially for stove manufacturers using special finishes. Purchases in the farming sections also continue good.



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Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—Figuring all active capacity at present, tin plate producers are able to operate at an average of 80 per cent. Many still have good order backlogs. Prices on tin mill products are quoted on the basis of $5.25 per base box for tin plate; 2.75c for 28 gage mill black, and 3.40c for No. 24 unassorted long ternes.

New York—Tin plate specifications are heavy, with good demand for special ternes from oil companies for retail fuel containers. Increasing trend in use of small containers, incidentally, is affecting demand for steel for filling station high-boys.

Shapes

Structural Shape Prices, Page 70

New York — McClintic-Marshall Corp., Bethlehem, Pa., is low on suspended spans and viaduct approaches for the Triboro bridge, New York, approximately 32,500 tons of structural steel and close to 600 tons of other steel, including castings, railing and miscellaneous requirements. There were five bidders, further details being given under structural contracts pending in this issue. An additional 20,000 tons of structurals are expected to be out for bids shortly. Except for this bridge and several thousand tons active for schools, inquiry is light.

Pittsburgh—Bids close March 18 by National Steel Corp., Pittsburgh, for the construction of a strip mill building at its Great Lakes Steel Corp. division, Detroit, requiring 10,300 tons of structural steel. Among other new inquiries is about 2500 tons of steel sheet piling and structural shapes for Baltimore & Ohio railroad grade crossing elimination work at Staten Island, N. Y. Plain structural shapes hold at 1.80c, base Pittsburgh, although fabricated prices are unsteady.

Cleveland—Structural shape demand is a little more active. The Austin Co., Cleveland, which has the general contract for a Chicago plant for the Electro-Motive Corp., General Motors subsidiary, is purchasing about 1500 tons here. Chevrolet has awarded 380 tons for a gear and axle plant addition at Detroit, and Chrysler is taking bids on 350 to 400 tons for an addition to its Dodge truck plant, Detroit. United States engineer, Zanesville, O., will open bids March 19 on 1200 tons of steel piling for work in the Muskingum, Ohio, conservancy district. Railroads will do little bridge or grade elimination work until the government decides what aid it will extend under the proposed public works appropriation now before congress.

Chicago—Structural awards of about 3000 tons are heavier than the average of the past several weeks, though inquiries are lighter and consist almost entirely of small lots for public projects. Low bidder for the general contract for the Ashland avenue bridge here, taking 2500 tons, has been announced but new business in the immediate Chicago district otherwise is made up principally of lots of less than 100 tons.

Boston—Construction projects requiring structural steel, especially schools, are slightly more numerous. Volume, however, is not large. Some district shops are benefiting from awards for small postoffices.

Philadelphia—While some fair work is in sight, including six junior high schools in this city, structural business at present is quiet. A high school at Cumberland, Md., which would have required 600 tons of shapes, and a substantial tonnage of bars, has been postponed indefinitely. One of the largest jobs up for immediate action calls for 420 tons of shapes for building construction and 260 tons for barrel racks for the North American Warehousing Co.,

Shape Awards Compared

	Tons
Week ended March 16	10,179
Week ended March 9	9,242
Week ended March 2	11,321
This week in 1934	21,533
Weekly average, 1934	16,284
Weekly average, 1935	12,622
Weekly average, February	13,702
Total to date, 1934	206,577
Total to date, 1935	138,839

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San Francisco — The largest structural award in the week involved 800 tons for the postoffice at Phoeniz, Ariz., placed with Pacific Coast Steel Corp., San Francisco. Awards for the year now total 13,292 tons, compared with 17,530 tons in the corresponding period in 1934. Consolidated Steel Corp., Los Angeles, booked 370 tons for a hospital in that city. Transmission towers for the metropolitan water district, Los Angeles, involving 6500 tons, will be up for bids shortly. The Southern Pacific Co. has taken bids on 425 tons for a subway at South San Francisco. The metropolitan water district, Los Angeles, has rescinded the award of 1070 tons for tunnel ribs, placed two weeks ago with Consolidated Steel Corp., and has reawarded the material to the Youngstown Steel Car Corp., Los Angeles.

Seattle—The market has an improved outlook, several projects pending of considerable importance. Awards during the week totaled 200 tons. Bids have been opened by the United States engineer at Portland, Oreg., for two portable stop-log dams and two large derricks, for the Bonneville, Oreg., project, requiring 350 tons of shapes, and 60 tons of castings, all nickel steel. D. A. McKinnon, Montana state PWA engineer, Helena, Mont., announces 1901 projects, estimated at $254,000,000, to be submitted soon. Included are 84 water systems, 55 bridges and heavy structures, and 267 flood control and irrigation projects, the latter alone totaling $100,000,000.

Shape Contracts Placed

1600 tons, bridge, Long Island railroad, St. Albans, N. Y., to National Bridge Co., Long Island City, N. Y., with Jones & Laughlin Steel Corp., Pittsburgh, to fabricate; through Faircroft Engineering Co.

1325 tons, plate glass plant building, Ford Motor Co., Dearborn, Mich., to McClintic-Marshall Corp., Bethlehem, Pa.

1024 tons, steel sheet piling for Pickwick dam, Tennessee valley authority, equally divided between Carnegie Steel Co., Pittsburgh; Jones & Laughlin Steel Corp., Pittsburgh; Bethlehem Steel Co., Bethlehem, Pa., and Inland Steel Co., Chicago; bids Feb. 4.

800 tons, postoffice, Phoenix, Ariz., to Pacific Coast Steel Corp., San Francisco.

675 tons, service and emergency gate frames, Sheffield, Ala., to Bartlett-Hayward Co., Baltimore.

480 tons, two state highway bridges, Morgan City, La., and Monroe, La., to Jones & Laughlin Steel Corp., Pittsburgh.

380 tons, addition, gear and axle plant, Chevrolet Motor Co., Detroit, to R. C. Mahon Co., Detroit; Jones & Laughlin Steel Corp., Pittsburgh, to supply steel.

370 tons, White memorial hospital, Los Angeles, to Consolidated Steel Corp., Los Angeles.

325 tons, bridge, Perry, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

310 tons, state bridge, Depot street, Beacon, Conn., to American Bridge Co., Pittsburgh.

300 tons, bridge, Mooresville, Ind., to Central States Bridge & Structural Co., Indianapolis.

300 tons, plant building, Troy, O., to Ingalls Iron Works Co., Birmingham, Ala.

250 tons, bridge, Cedarburg, Wis., to Worden-Allen Co., Milwaukee.

250 tons, plant for Monolith Portland Cement Co., Los Angeles, to Pacific Coast Steel Corp., San Francisco.

225 tons, state highway bridge, Kansas, to Ben Sibbitt Iron & Foundry Co., Wichita, Kans.

200 tons, state highway bridge, Hamilton, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

200 tons, cranes, Sheffield, Ala., to Harnischfeger Corp., Milwaukee.

185 tons, plant addition, Armstrong Cork Co., Lancaster, Pa., to A. B. Rote, that city.

155 tons, state bridges NRH 28A and 179A, Wyoming, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

145 tons, bulkhead gates, United States bureau of reclamation, Boulder City, Nev., specification 648-D, to Mississippi Valley Steel Co., Decatur, Ill.

140 tons, state bridge, Northampton street, Holyoke, Mass., over tracks of New York, New Haven & Hartford railroad, to Boston Bridge Works Inc., Cambridge, Mass.; Daniel O'Connells' Sons, Holyoke, general contractors.

125 tons, ice plant for Santa Fe railroad, Calawa, Calif., to Pacific Coast Steel Corp., San Francisco.

105 tons, Erie basin, foot of Richards street, Brooklyn, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; Robbins & Ripley Co., general contractors.

110 tons, stock house, German Brewery Co., Cumberland, Md., to Fort Pitt Bridge Works, Pittsburgh.

100 tons, remodeling steamer ADMIRAL PEOPLES, to Wallace Bridge & Structural Steel Co., Seattle.

100 tons, steel sheet piling, Ebey Slough, Wash., state bridge, to Pacific Coast Steel Corp., Seattle.

100 tons, dormitory, state hospital, Sykesville, Md., to Maryland Steel Products Co. and National Building Supply Co., Baltimore; Davis Construction Co., Baltimore, general contractor.

Shape Contracts Pending

33,000 tons, including 570 tons of castings, railing and miscellaneous steel, suspended spans and viaduct approaches, Triboro bridge, New York, McClintic-Marshall Corp., Bethlehem, Pa., low, $3,114,426, bids March 14. Harris Structural Steel Co., New York, second, $3,497,995; American Bridge Co., Pittsburgh, third, $3,517,704.50. Other bidders Taylor-Fichter Steel Construction Co., New York, and John A. Roebling's Sons Co., Trenton, N. J.

10,300 tons, strip steel mill building, Detroit, for Great Lakes Steel Corp., a subsidiary of National Steel Corp., Pittsburgh; bids March 18.

6500 tons, transmission towers, metropolitan water district, Los Angeles; bids soon.

4500 tons, shapes, plates and bars, Norfolk & Western railroad, second quarter requirements, bids March 27;

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2500 tons, steel sheet piling and structural shapes, Baltimore & Ohio railroad grade crossing eliminations, Staten Island, N. Y.

2500 tons, Ashland avenue bridge, Chicago; Ketler-Elliott Co., Chicago, low for general contract.

745 tons, state bridges, Texas.

680 tons, warehouse and racks, North American Warehousing Co., subsidiary of Continental Distilling Co., Philadelphia, general contractors' bids opened; will also require approximately 160 tons of bars.

600 tons, high school, Cumberland, Md., originally scheduled for bidding March 15, indefinitely postponed.

500 tons, state bridges, Iowa.

475 tons, medical barracks and nurses quarters, Ft. Sam Houston, Tex.

450 tons, estimated, junior high school, Philadelphia, specifications expected out within 30 days; 600 to 700 tons of bars also will be required.

425 tons, subway for Southern Pacific Co., South San Francisco, Calif.; bids opened.

410 tons, including nickel steel castings, two portable dams Bonneville project, Oregon; bids in.

350 to 400 tons, addition to Chrysler's Dodge truck plant, Detroit; bids being taken.

250 tons, piling, Rye Patch dam, Nev., specification 20,383-A; bids opened.

200 tons, state highway bridge, Cornell, Wis.; bids March 26.

200 tons, dormitories, Smith college, Northampton, Mass.

175 tons, cranes, American Sheet & Tin Plate Co., Gary, Ind.

175 tons, state highway projects, mainly Iberia parish, Louisiana; bids April 3.

150 tons, department store building, Leverson & Kline, Baltimore.

150 tons, state highway bridge, Evanston, Ill.

130 tons, garage, addition to shop of Perkins school, board of education, Akron, O., and city hall, Cuyahoga Falls, O., near Akron; bids being taken.

100 tons, school, Warm Springs, Mont.

Reinforcing

Reinforcing Bar Prices, Page 71

Pittsburgh — Baltimore & Ohio railroad has inquiries out, bids to close March 21, for 4000 tons of reinforcing bars for Staten Island, N. Y., work. Relocation of Pennsylvania railroad tracks at Dover, O., has been awarded to John Condon, Omaha, Nebr., general contractor, requiring 100 tons of bars. Distributors continue to quote new billet reinforcing bars on the basis of 2.05c, Pittsburgh, for carload cut lengths, and 1.95c, Pittsburgh, for rail steel quality.

Chicago—Both orders and inquiries are heavier. Awards include 360 tons for two industrial buildings, while inquiries have been increased substantially by requests for bids on 6500 tons for a Chicago district sewage disposal plant and 750 tons for the southwest intercepting sewer here. Jackson, Mich., has placed contracts for a sewage disposal plant involving 687 tons. Among other awards expected to be made here soon are 700 tons for the Olson Rug Co. plant and 575 tons for a building for the Fleischmann Malting Co.

Boston—Rail steel reinforcing demand continues to lead that for billet bars. Active pending volume is fair, although new inquiry is limited. Small-lot buying, however, has improved.

Cleveland—Purchases are meager, several substantial tonnages previously noted still pending. Wheeling & Lake Erie railroad may decide to build its dock at Huron, O., with reinforcing material, taking about 110 tons, instead of 600 tons of steel piling for which it recently inquired.

New York—Reinforcing steel buying has increased materially with inquiry heavier. Awards total 1200 tons. Included in orders placed are 750 tons for Triboro bridge piers. In addition to 135 tons pending for a Hartford, Conn., sewer, another inquiry for similar work is expected out soon, taking close to 600 tons.

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this city, general contractors, have closed on 230 tons of bars for government barracks at Carlisle, Pa., but have taken no action on the 650 tons of bars for the local naval aircraft factory. Delay in the placing of this latter tonnage is said to be due to a slight revision in specifications. A junior high school here is expected to come up for bids within a month, requiring possibly 650 tons of bars. Billet steel bars, cut lengths, are 2.05c, Pittsburgh, or 2.34c, Philadelphia.

San Francisco — Bookings during the week totaled less than 1500 tons. However, awards to date this year are nearly double those for the corresponding period in 1934. Bids were rejected on 463 tons for the auditorium, Fresno, Calif. Bids will be opened March 19 for 400 tons for the Hall of Records at Fresno.

Seattle—Contract to supply 1200 tons of hot-rolled rods, reinforcing and mesh, also 800 tons of sheets has been awarded to the Columbia Steel Corp., San Francisco, and Bethlehem Steel Co., Bethlehem, Pa., by the American Concrete Pipe Co., Tacoma, Wash., general contractor for 34,091 feet of 54-inch lock joint concrete pipe for Tacoma.

Concrete Awards Compared

	Tons
Week ended March 16	**6,245**
Week ended March 9	**1,726**
Week ended March 2	**5,215**
This week in 1934	**4,483**
Weekly average, 1934	**4,084**
Weekly average, 1935	**5,098**
Weekly average, February	**5,506**
Total to date, 1934	**48,948**
Total to date, 1935	**56,083**

Reinforcing Steel Awards

2000 tons, reinforcing bars mesh and sheets, for Tacoma, Wash., lock joint concrete pipe line to Bethlehem Steel Co., Bethlehem, Pa., and Columbia Steel Corp., San Francisco; American Concrete Pipe Co., Tacoma, general contractor.

750 tons, piers, Triboro bridge, New York, divided between Kalman Steel Corp., Bethlehem, Pa. and Fireproof Products Co., New York.

687 tons, sewage disposal plant, Jackson, Mich., to Capitol Steel Corp., Lansing, Mich.

580 tons, Michigan City, Ind., filter plant, to Concrete Steel Co., Chicago.

450 tons, 5-story rack house, Maryland Distillery Inc., Relay, Md., to Concrete Steel Co., New York; Engineering Contracting Corp., Baltimore, general contractor.

260 tons, plant building, E. J. Brach & Sons, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

230 tons, government barracks, Carlisle, Pa., awarded through Erwin & Leighton, Philadelphia, to American Steel Engineering Co., Philadelphia.

225 tons, bridge, Long Island railroad, St. Albans, N. Y., to National Bridge Co., Long Island City, N. Y.; through Faircroft Engineering Co.

200 tons, White memorial hospital, Los Angeles, to unnamed interest.

175 tons, reservoir, Ogden, Utah, to unnamed interest.

150 tons, alterations to high school, Huntington Park, Calif., to unnamed interest.

150 tons, Illinois road work, to Concrete Engineering Co., Chicago.

145 tons, building, St. Joseph college, Hartford, Conn., to Sherer Steel Co., Hartford.

143 tons, two state bridges in Denver county, Colorado, to Geo. Phillips, Denver.

100 tons, plant building, Wander Co., Villa Park, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

Reinforcing Steel Pending

6500 tons, aerations and final settling tanks, Stickney, Ill.; bids to Chicago sanitary district board, March 28.

4000 tons, Staten Island grade elimination projects, for Baltimore & Ohio railroad, Baltimore; bids March 21.

1000 tons, postoffice, Richmond, Va.; J. P. Jones, Charlotte, N. C., general contractor.

750 tons, southwest intercepting sewer for Chicago sanitary district.

700 tons, plant building, Olson Rug Co., Chicago; B-W Construction Co., Chicago, low for general contract.

650 tons, estimated, junior high school, Philadelphia; bids expected to be asked within 30 days.

575 tons, building, Fleischmann Malting Co., Chicago; general contract to E. W. Sproul Construction Co., Chicago.

463 tons, auditorium, Fresno, Calif.; bids rejected and new design will be prepared.

415 tons, Cherry creek retarding dam, near Sullivan, Colo.; bids soon.

410 tons, state highway projects, Sabine and St. Landry parishes, Louisiana; bids in March 13.

400 tons, Hall of Records, Fresno, Calif.; bids March 19.

400 tons, state highways and bridges, Texas; bids in March 11.

370 tons, plus mesh, addition to Library of Congress, Washington; bids March 22.

316 tons, including gates, Succor creek, Owyhee, Oreg., project; bids at Ontario, Oreg., March 28.

250 tons, sewer, Bronx, New York; bids March 19.

200 tons, Illinois road work, bids March 22.

190 tons, transit shed, pier No. 1, Long Beach, Calif.; bids soon.

160 tons, warehouse, for North American Warehousing Co., subsidiary of Continental Distilling Co., Philadelphia, general contractors' bids opened last week.

150 tons, reinforcing bars, pipe and structural steel, Senecaville, O., dam, Muskingum conservancy district project; bids April 2 to Zanesville, O., army engineers. Bids for traveling crane and hoist included in this project.

128 tons, bridge project, Port Angeles, Wash.; bids in.

110 tons, Kentucky state highway department projects; bids March 22, Frankfort, Ky.

100 tons, relocation of Pennsylvania railroad tracks, Dover, O.; John E. Condon, Omaha, Nebr., general contractor.

100 tons, Mohicanville, O., dam, Muskingum conservancy district project; bids to be taken in April by Zanesville, O., engineers.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

A few nut and bolt users to whom the new prices have been quoted, 5 points up, have replied they could buy at lower figures, indicating the advanced levels have not been firmly

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established. As usual when prices are raised, jobbers are slow in making new commitments.

On contract releases at Cleveland tonnage this month shows little change from the same period last month. Specifications from leading automobile manufacturers are active, reports indicating they still are considerably behind their retail demands. A few carloads have been specified by railroads, mainly for emergency repair work. Shipments to agricultural implement manufacturers have decreased.

Low rate of activity at structural and railroad car repair shops has limited sales of rivets at Pittsburgh, the price remaining steady at 2.90c, Pittsburgh and Cleveland, and 3.00c, Chicago.

Pipe

Pipe Prices, Page 71

Pittsburgh — Production and shipments have already commenced on the two recent pipeline projects awarded by General Petroleum Corp., Los Angeles, and Champlin Refining Co., Enid, Okla. Recent federal legislation directed against holding companies is noticeably holding up the pipe purchases of oil and gas interests. Steady demand at recent unchanged levels continues for boiler tubes and alloy mechanical tubing for automobile front axles.

All discounts on tubular products are without change.

Cleveland—Inquiries for pipe for public work are at an unusually low ebb for this time of the year. Many cities apparently have exhausted their resources, and are waiting for the government to take further initiative. Shipments of steel pipe to jobbers for general maintenance work are moderate.

Chicago — Recommendation has been made for the award of 3258 tons of 20 to 54-inch pipe by Chicago to low bidders announced a week ago. An additional 2100 tons of small diameter pipe wil be placed soon. Other orders lately have been small but the outlook is for an increase in both awards and inquiries during the next several months.

New York—While cast pipe buying is largely for small lots, which are slightly more numerous, a substantial volume is pending, awards being contingent upon PWA approval. Considerable volume also will be released by additional loans to be approved soon, including requirements for Utica and Syracuse, N. Y. Bids on 800 tons for Greenburgh, N. Y., may be readvertised. New York city closes on general contracts this week, taking 750 tons in addition to several thousand tons pending to be bought by contractors.

Philadelphia—Recent let-down in demand for oil country tubular goods is attributed to heavy rains in East Texas, and hence is regarded as only temporary. Mills specializing in this business are restricting operations somewhat, although production continues at a good rate.

Birmingham, Ala.—Production of cast iron pressure pipe has been lifted slightly to between 35 to 40 per cent. However, orders continue in small lot quantities, and even with the opening of the spring season, a material change in conditions is not anticipated, unless developed by the new federal work relief bill.

Seattle—Demand for cast iron and steel pipe is below normal. Pacific Water Works Supply Co., Seattle, has booked a tonnage of 12-inch cast iron for the Ebey Slough, Wash., state project. Aberdeen, Wash., has placed an order for wood stave pipe which will require about 50 tons of bands and castings.

San Francisco—The only cast iron pipe award of size was 133 tons for Ekalaka, Mont., placed with an unnamed interest. Few new inquiries

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THE new nine-span bridge superstructure, built for the Susquehanna River crossing of the Reading Company, marks the first use of a solid steel deck on a railroad bridge.

The Phoenix Bridge Co., in erecting this superstructure, used two Industrial Brownhoist cranes; one of 60, the other of 50 tons capacity. Commenting on their cranes, this company says, "We have used Industrial Brownhoists since 1916 and our experience with them has been very satisfactory. The cost of maintenance has been very reasonable, considering the heavy work required of them".

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developed during the week. Bids have been taken on over 5000 tons for the Hetch Hetchy bay-crossing pipe line, San Francisco. Beverly Hills, Calif., has taken bids on 194 tons. Grinnel Co. of the Pacific booked 106 tons of black pipe for the metropolitan water district, Los Angeles.

Cast Pipe Placed

3258 tons, 20, 24, 36 and 54-inch, Chicago; 575 tons, 20 and 24-inch to Lynchburg Foundry Co., Lynchburg, Va.; balance to United States Pipe & Foundry Co., Burlington, N. J.

500 tons, 24-inch, New Rochelle, N. Y., to Albert Pipe Supply Co., Brooklyn, N. Y.

175 tons, 8-inch and under, Beattyville, Ky., to United States Pipe & Foundry Co., Burlington, N. J.

133 tons, 4 and 6-inch, class 150, Ekalaka, Mont., to unnamed interest.

Steel Pipe Placed

106 tons, 12-inch, black pipe, metropolitan water district, Los Angeles, to Grinnell Co. of the Pacific, Los Angeles.

Cast Pipe Pending

750 tons, mainly 20-inch, department of water supply, gas and electricity, New York; two additional contracts closing this week. Projects also require additional steel pipe.

375 tons, 2 to 8-inch, waterworks improvement, Ripley, Miss.; plans considered.

282 tons, Oakley, Utah; bids in.

225 tons, mostly 6-inch, Burgaw, S. C.; bids March 21; also 75,000-gallon steel tank on 75-foot tower.

194 tons, 6 to 12-inch, class 150, Beverly Hills, Calif.; bids in.

150 tons, small sizes, state project Saratoga Springs, N. Y.; general contract awarded.

100 tons, 5500 feet of 6-inch, 200 feet of 4-inch class 150, and 48 feet of 12-inch class A, waterworks improvement, Stevenson, Ala.; bids March 15.

100 tons, small sizes, Newark, N. J.

Unstated tonnage, 22,490 feet of 6 and 8-inch, Marion, Wis.; James B. Clow & Son, Chicago, low.

Unstated tonnage, 5000 feet of 8-inch, Stratford, Wis.; United States Pipe & Foundry Co., Burlington, N. J., low.

Strip Steel

Strip Prices, Page 71

Pittsburgh—With backlogs for two to three weeks, producers of both hot-rolled and cold-rolled strip steel are holding operations at about 65 per cent. Reappearance of several important strip steel buyers, mainly some General Motors Corp. units in the Detroit district, is noted. The market is firmly quoted 1.85c, Pittsburgh, for hot-rolled strip, and 2.60c, Pittsburgh or Cleveland, base, on cold-rolled strip.

Cleveland—Strip mill operations here continue at capacity, due mainly to automobile requirements. New specifications from this source, however, are diminished, and there is little miscellaneous business.

Chicago—Shipments of strip steel are well maintained, but new business is less active than earlier in the quarter when consumers were pressing for delivery. A moderate volume of second quarter tonnage has been entered, with some consumers concerned over availability of supplies during April and May. Automotive demand is less pressing, though shipments are in fairly steady volume.

Boston — Incoming cold strip volume lags behind shipments, both having declined slightly. Frequent limited orders of varied specifications marks activity. Slit sheets continue to cut into narrow cold-rolled, the latter being 2.80c, Worcester, Mass.

New York—Buying of narrow strip includes some fair tonnages from toy manufacturers but needs for containers small.

Philadelphia—Strip specifications show little improvement, with narrow sizes of hot strip 1.85c, Pittsburgh, or 2.14c, Philadelphia, and cold strip 2.60c, Pittsburgh, or 2.89c, Philadelphia.

Wire

Wire Prices, Page 71

Pittsburgh—Less insistent delivery requests and fewer orders for manufacturing wire are noted, thus accounting for the poor showing so far in March. Nails, fencing and other merchant items are being taken only in small amounts by jobbers. Manufacturing wire remains quoted 2.30c, Pittsburgh, for carload lots; spring wire, 2.90c, and nails, $2.60 per keg.

Cleveland — Specifications from practically all sources active recently are slower and wire mill operations here have been reduced 5 points to 55 per cent. Nut and bolt manufacturers still supply good orders, traceable mainly to automobile requirements. A slight improvement is noted in buying by jobbers.

Chicago—Wire demand is lagging somewhat compared with the brisk activity earlier this quarter. While consumption is fairly steady, consumers are less urgent for delivery. Second quarter bookings are slow to accumulate but shipments during the balance of March are expected to remain fairly steady. Demand for wire products in agricultural districts is not improved materially.

Boston—Demand for wire entering into manufactured products, notably consumer goods, tends to hold incoming volume to the recent rate. Buying is spread over a broad field. The jobbing trade, however, continues to buy conservatively.

Philadelphia—Wire demand, while fairly good, is less active, and in the case of wire nails, sellers complain of the spread of German competition on the eastern seaboard. This competition was first noted along the southern Atlantic seaboard states, and while it has not as yet etxended to this immediate district, it has been working further north in recent

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weeks. German offerings, it is said, are substantially under those of domestic producers.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—Although a federal loan has been granted to reopen the Struthers Iron & Steel Co., Struthers, O., details on blowing in have not been announced. While the market is steady as to price, there is little tonnage support. Local radiator shops are curtailing and jobbing foundries are operating two and three days a week. Included in pig iron shipments is fair representation of southern grades, both foundry and charcoal, all-rail delivered. Local Pittsburgh furnaces continue to quote $18 for basic iron, $18.50 for foundry and $19 for bessemer. Union Steel Casting Co., Blawnox, Pa., has received an award from the New Orleans army engineers for two 76-inch diameter cast steel impellers.

Cleveland—Both pig iron and by-product foundry coke shipments maintain a substantial lead over the February tonnage for comparable periods. Foundries are acquiring more fuel, in view of the possibility of a bituminous coal strike, but actual consumption is increasing, mainly at automobile and agricultural implement plants. Pig iron sales during the week dropped slightly to 4000 tons.

Chicago—Second quarter pig iron bookings show an increase of nearly 40 per cent over orders received three months ago for first quarter shipment. The movement against present contracts shows a moderate gain over the February rate and is substantially heavier than a year ago. Production of farm implements still is trending upward, while automotive foundries maintain previous operations. No. 2 foundry and malleable pig iron continue $18.50, furnace.

Boston—Pig iron buying is limited to small lots, frequently to truckloads. Consumers have shown slight interest in second quarter, Foundry melt in New England has not improved materially, estimated at 25 to 30 per cent, although a few are doing better than that rate.

New York—Pig iron tonnage is less active than a week ago, with the situation generally quiet. The price on malleable iron at Birmingham, Ala., has been withdrawn, no listing on this grade now being posted with the steel code authority. A price of $14.50, Birmingham, had been listed.

Washington—Bids close March 26 on 250 tons of low phosphorus pig iron, bureau of supplies and accounts, navy department, for delivery. Washington, on schedule 4517. The supply officer, local navy yard, also is inquiring for 100 tons of foundry iron, schedule 494.

Philadelphia—Possibility of a coal strike has not resulted in any future buying of pig iron here. Purchases, if anything, have been on a more conservative basis, with developments in Washington continuing to inject an element of uncertainty. Producers' stocks of coke and pig iron are considered as being substantial. In view of the possibility of an advance in freight rates, producers are including clauses in future contracts protecting them against possibility of an increase in the rate. Such clauses at one time were a regular part of all contracts but lately had been dropped.

Cincinnati—Pig iron users continue to buy in small lots, contracts so far entered representing only a minor part of second quarter needs. Shipments continue even better than in February. The melt is steady. Southern iron is in better demand on new ordering.

St. Louis—Pig iron bookings have been mainly in small lots for prompt,

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DETROIT

and in many cases rush, shipment. Consumer stocks are not increasing to any appreciable extent, despite heavy tonnages being taken in. Farm implement interests continue to account for a heavy quota of the entire melt. Plants turning out complete farm machinery are running at a high rate, and makers of parts, notably wheels, in many instances are operating at capacity.

Seattle—The market is dull, volume showing no increase. Steel foundries are more active than iron foundries. Some English hematite, low in phosphorus, is imported occasionally for special jobs. Domestic iron is unchanged at $17.50, base, Provo, Utah, or $23 f. o. b. plant, Seattle.

Birmingham, Ala.—Increasing demands from melters in southern territory are encouraging to merchant pig iron producers of the district. An increased demand for spot shipments is noted, and bookings for second quarter delivery are larger. The price remains $14.50 No. 2 foundry base.

Toronto, Ont. — While sales continue in small tonnage lots, the weekly total is holding around 600 tons. The daily melt has increased to slightly over 40 per cent.

Scrap

Scrap Prices, Page 73

Chicago—Weakness in steel and iron scrap prices has been evident and willingness of dealers to accept orders for heavy melting steel at $10.50 has lowered the market 50 cents to a range of $10 to $10.50. Other grades have been marked down a similar amount. In spite of this lower level mills are still out of the market. Prices on most grades on recent railroad lists are relatively high. Most contracts by dealers have been filled and there is little buying for this purpose.

Pittsburgh.— A weak situation yielded another 25 cents a ton last week in No. 1 heavy melting steel, placing the market at $12 to $12.50 per ton for local delivery. Hydraulic compressed sheets, hand-bundled sheets, scrap rails and some specialty grades underwent a similar 25-cent per ton decline, although machine shop turnings were off 50 cents to $7 to $7.50. With Youngstown delivery generally shut off, the Pittsburgh district has been undergoing heavy selling offers from the Detroit district on compressed sheet scrap and turnings, although mills here are definite in their policy of abstaining from purchases. An interesting development has been recent inquiry for scrap pipe for export.

Cleveland—Lack of buying of steel and iron scrap has brought weakness and a decline of 50 cents per ton in quotations here and in the valley. Shipments to consumers on contract are at a satisfactory rate. Brokers are not willing to contract at the present level.

Boston—Further weakness has developed in the active scrap grades, including heavy melting steel for export, New England delivery and shipment to Pennsylvania districts, although current quotations practically eliminate business to the latter. The Worcester, Mass., steel works is not paying better than $8.50, delivered for No. 1. That grade is off 25 cents to $8.75, dock, for export and No. 2 steel scrap has declined in line. Buying for boat loading is less active.

New York—Domestic scrap buying is at a low ebb, demand for all grades being light. Export activity continues well sustained with a steadying influence on prices, especially for heavy melting steel.

Washington — Alabama Great Southern takes bids March 29 for the sale of 5210 gross tons of 85-pound rail, 12,860 rail joints and 96,000 tie plates. Bids go to L. H. Skinner, the railroad's purchasing agent, McPherson square, Washington.

Philadelphia—Continued dullness in domestic buying is further depressing scrap prices. No. 1 heavy melting steel is holding at $10 to $10.50, delivered, consuming point; railroad grate bars, $8.50 to $9, new compressed sheets $10; steel shafting, $16.50 to $17; heavy breakable cast, $10.50; low phosphorus steel crops, $14 to $14.50; and cast wheels, $11 to $11.50. No. 2 heavy melting steel is unchanged at $9 to $9.50; with the Pencoyd, Pa., consumer reported to have booked some tonnage of auto scrap at the inside figure. Contributing to the relative steadiness of No. 2 steel are continued good shipments abroad. At present two cargoes of steel scrap are being loaded here for Japan with a cargo for Italy to be started loading in a few days.

Detroit — Iron and steel scrap prices continue steady, indicating that a definite bottom has been reached at the level of $8 to $8.50 for No. 1 heavy melting steel and hydraulic compressed sheets. It is believed that prices will remain at practically this basis for at least 30 days. Scrap continues to come out at a high rate and if automobile plants continue to operate as they anticipate, a large excess of scrap will be accumulated in the next six weeks.

Cincinnati—Iron and steel scrap is weak, barely sustaining current quotations. Covering on a recent purchase of about 15,000 tons by a district mill interest is a support.

Seattle—The market has dropped about 50 cents, rails now $10.75 to $11, gross ton, and No. 1 melting steel $9.25 to $9.50. While exporters are trying to hold these prices the situation is weak, as Japan is not buying.

Toronto, Ont.—Trading in iron and steel scrap, while largely in steel grades, shows improvement in iron lines. Montreal dealers state that some inquiry for steel scrap is being

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received from Britain and they expect substantial shipments with opening of St. Lawrence navigation. Foundries are taking wrought scrap and machinery cast in small lots.

Birmingham, Ala.—Demand for scrap has lifted slightly. Scrap rails are being quoted at $11 to $11.50; rails for rerolling, $13 to $13.50; heavy melting scrap, $9 to $9.50 and No. 1, $8.50 to $9.

Warehouse

Warehouse Prices, Page 74

Pittsburgh—Volume of warehouse steel tonnage and number of orders for the first half of March was on a level with the same period in February. Other jobbing steel prices are steady and without recent development.

Cleveland — Warehouse tonnage booked so far this month is 10 per cent larger than that in the comparable period in February. During the past few days the number of orders has declined. Demand for pipe, bars and plates is fairly good. but few sales of structural shapes are noted.

Chicago—Business is steady, continuing to show a small increase over the rate a month ago and averaging 15 to 20 per cent heavier than in the corresponding period of last year. Demand for sheets has increased lately, partly due to slow mill delivery on some grades.

New York—Individual orders placed with warehouses average slightly larger and most jobbers' sales are ahead of last month. Competition with imported steel is most pronounced in bars and small shapes.

Philadelphia—March sales have been a disappointment to most jobbers, with the daily rate still under that of February. Normally, an improvement is noted in March. Prices are unchanged.

Detroit—The number of warehouse orders for iron and steel is holding its own with the preceding periods of this year, but there appears to be a slight recession in individual requirements.

Cincinnati—Warehouse sales are more numerous and volume will be heavier than in February or in the corresponding month of 1934, it is indicated. Little of the gain is attributable to building materials. Prices are steady.

Seattle — Wholesalers report a good volume of business, shapes, light plates and sheets leading. Private buying is increasing and public projects are accelerating demand.

San Francisco — Movement of warehouse material has shown some improvement. Prices remain unchanged.

Semifinished

Semifinished Prices, Page 71

Nonintegrated buyers of billets, wire rods and sheet bars are making only occasional commitments. All of the recent activity in sheet and tin bars, however, is maintained. The semifinished steel market is quoted on a Pittsburgh base as follows: Billets, blooms and slabs, $27; forging quality billets, $32; sheet bars, $28; common wire rods, $38 and combination wire rods, $40.

Ferroalloys

Ferroalloy Prices, Page 72

Pittsburgh—Ferroalloy specifications in the Pittsburgh district have declined. Several important buyers have held up shipments of ferromanganese, spiegeleisen and other ferroalloys, although fluorspar deliveries are on a fairly regular schedule. One important Pittsburgh mill took in several bargeloads of southern Illinois washed gravel fluorspar last week. Jones & Laughlin Steel Corp. is now producing ferromanganese in one of its three active Aliquippa works blast furnaces.

New York—Imported fluorspar, 85-5, is easier at $18.75 to $19, duty paid, tidewater, per net ton. This follows recent softening in the midwestern, with a somewhat firmer tendency noted. Ferromanganese is unchanged at $85, duty paid, Atlantic and Gulf ports and domestic spiegeleisen, 19 to 21 per cent $26, Palmerton, Pa., on quantities up to 50 tons and $24 on 50 tons and over. Little change is noted in recent volume.

Other ferroalloy prices have been reaffirmed for second quarter, following the recent extension of ferromanganese and spiegeleisen prices.

Iron Ore

Iron Ore Prices, Page 73

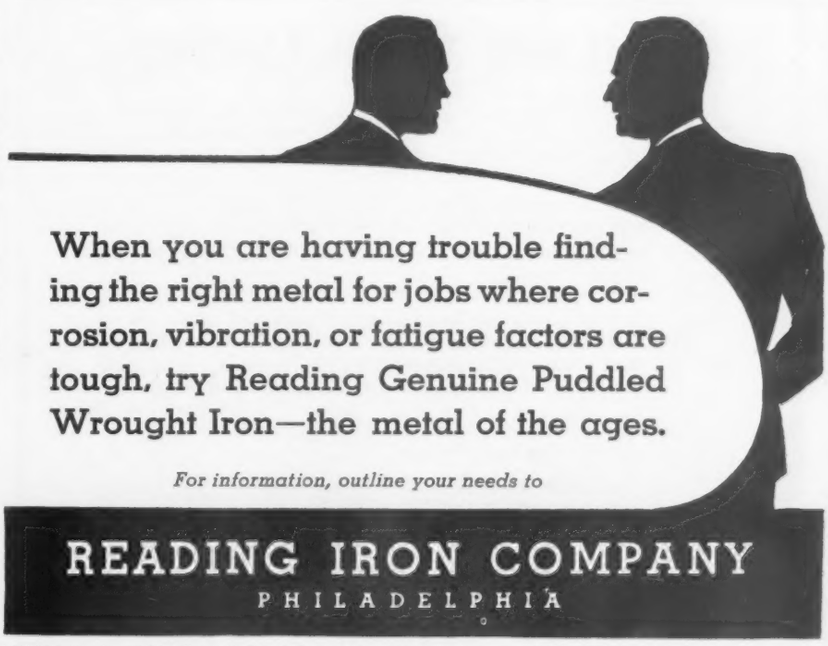
Cleveland—Consumption of Lake Superior iron ore in February totaled 2,467,269 tons, 186,876 tons more than in January, according to the Lake Superior Iron Ore association. Stocks on hand at lower lake ports and furnaces March 1 amounted to 29,557,805 tons, compared with 31,167,836 tons March 1, 1934. Inquiries have not appeared and prices have not been determined.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—An optimistic outlook for the success of the conference of copper producers developed last week when further progress was made than had been expected by most observers. While official reports were not issued it was understood that the conferees had agreed upon a percentage and graduated curtailment plan for foreign production, the first step to be effective May 1, and upon a tentative marketing plan.

Copper—Sales are ahead of the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same time a month ago with total allocated through Thursday totaling 16,047. Copper and brass mills are operating between 65 and 70 per cent of capacity and have been active buyers in the market. Export copper prices were easy in a quiet market. Toward the end of the week, however, prices advanced to around the 6.70c, c.i.f., level.

Lead—Demand held at a fairly active pace with leading sellers equalling ore intakes from day to day. Trade estimates place consumers' March requirements about 85 per cent covered. Prices held firm at 3.55c, New York, with St. Joseph Lead maintaining a $1 premium, and 3.40c, East St. Louis.

Zinc—Curtailment of prime western zinc production, reputedly about 20 per cent, is reported as working out successfully. Sales were light but prices held steady at 3.90c, East St. Louis. Slab zinc sales totaled about 3700 tons for the week.

Tin—Straits tin market was unsettled due to fluctuations in the London quotations and wide movements in the pound sterling exchange rates. Tin plate operations were between 75 to 80 per cent of capacity so consumption is believed to be well sustained. Export quotas of signatory countries were raised 5 points to 45 per cent of the 1929 production rate.

Antimony—Market was dull with prices unchanged at 14.50c, duty paid, for Chinese spot. Imports of antimony from China during February were reported at only 10 tons.

Aluminum—Market was quiet with prices unchanged.

Metallurgical Coke

Coke Prices, Page 71

The heaviest coal and coke shipments in recent years continue to take place from mines and coking ovens in western Pennsylvania, chiefly in anticipation of labor difficulties April 1. All captive mine operators are stocking coal, and one large interest at Pittsburgh is estimated to have between 300,000 and 400,000 tons of coal for coking above ground. The official market on beehive furnace coke is nominally $3.85 per ton, and on foundry coke, either $4.60 or $5.10 per ton, but shading is reported.

Shipments at Chicago compare favorably with those of February with consumers somewhat uneasy over possible strike interruption in supplies. Prices hold steady.

Removal of duty of $2 per ton on British coke has reduced the delivered price on the Pacific coast, $12.50 per ton being the present basis.

Coke By-Products

Coke By-Product Prices, Page 71

New York—With the exception of phenol, coke oven by-products are more active. Industrial demand for phenol has declined. Among distillates, toluol and xylol are in short supply, most distributors being unable to take spot orders. Lacquermakers are heavy purchasers. Sulphate of ammonia shipments are heavy, mainly to fertilizer interests, demand in the South being especially brisk. Both contract and spot shipments of naphthalene have improved, and prices somewhat steadier.

Steel in Europe

Foreign Steel Prices, Page 74

London—(*By Cable*) — Although production of pig iron in Great Britain in February was below that of January the daily rate of production was above the January rate. Pig iron was produced in February at the rate of 17,253 tons per day, compared with 16,813 tons in January, a gain of 440 tons per day, or 2.6 per cent. Total production was 483,100 tons in February, compared with 521,200 tons in January. Furnaces active Feb. 28 numbered 97, compared with 96 Jan. 31.

Average daily production of steel ingots and castings in February was 32,062 tons, compared with 25,153 tons in January, a gain of 6909 tons per day, or 27 per cent. Total output in February was 769,500 tons, compared with 757,800 in January.

A better movement of pig iron in the domestic market is noted, with the furnace position strong, as there are practically no stocks on hand. The steel market is active, with exports expanding. Demand for semi-finished steel is stronger and imports continue to be restricted. Plate mills are busy. In the Midlands trade is dull, with the automotive industry leading in production. Sheets, tin plate and galvanized sheets are quiet. The Continent reports that sterling fluctuations and uncertainties as to the future of cartels have upset trade. Manchuria, Egypt and South America are the best markets.

Quicksilver

New York—Quicksilver prices are unchanged in a quiet market. Sales during the past week have been light. Round lots of 100 flasks or more are available at $72.50, a virgin flask of 76 pounds, and small lots of 15 to 24 flasks, inclusive, at $74. Single flasks sell at $75.

Activities of Steel Users and Makers

ALLIS-CHALMERS MFG. CO., Milwaukee, has experienced heaviest demand in its history for products of its tractor department, both industrial and agricultural. For the first half of March shipments were the largest for any similar period in its tractor experience. The light tractor division at West Allis,

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Wis., is working two shifts and the crawler type division at Springfield, Ill., also is unusually busy. The tractor implement division at LaCrosse, Wis., is on a 24-hour basis, six days a week, with a schedule for first half of 1935 three times as large as for all of 1934. Orders on file call for three 8-hour shifts until July or August. Steel purchases of 2000 tons since Jan. 1 exceed total purchases of five years from Dec. 31, 1924, to Jan. 1, 1930. New equipment has been installed, including a 250-ton mechanical stamping, blanking and forming press, four drill presses and an engine lathe. A large hydraulic press remains to be purchased.

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Cleveland Frog & Crossing Co., Cleveland, manufacturer of frogs, crossings, manganese rail special work, and similar railroad supplies, is celebrating its fiftieth anniversary of business existence in 1935.

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Marshall K. McCosh, Piper building, Baltimore, has opened an office as manufacturer's agent, covering general contractors, builders, sheet metal workers, plumbers and larger industries of Baltimore and Washington.

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H. M. Davison Co., 194 Frelinghuysen avenue, Newark, N. J., and 30 Church street, New York, has been made sales agent for Simplicity Engineering Co., Durand, Mich., in Connecticut, southeastern portions of New York, northern half of New Jersey and metropolitan New York.

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Reading Iron Co., Reading, Pa., has formed a commercial research department, for the purpose of furnishing information on the relative values of various kinds of pipe in specific uses. The department is to base its conclusions solely on conditions of service and the service records of various kinds of pipe under those conditions. The service is without charge and is available to any person who desires to use the right kind of pipe for the purpose it is to serve. The company recently held its first general sales meeting since 1931, attended by representatives from all sections of the country. Plant visitations and outlines of plans for the future brought the personnel into closer touch.

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McCallum-Hatch Bronze Co. Inc., 27 Carolina street, Buffalo, has acquired the business of William H. Barr Inc., manufacturer of brass, bronze, copper and aluminum castings. The new company includes the same personnel and staff as the old and will continue production uninterruptedly in the same plant and offices. John C. McCallum is president and treasurer, James A. Hatch vice president and sales manager, and William F. Hagedorn secretary. Mr. McCallum has been engaged in the nonferrous foundry business for many years and for the past nine years has been in complete charge of the plant and manufacturing activities of William H. Barr Inc. Mr. Hatch for some time was employed by the Lackawanna Steel Co. and for ten years has been engaged as sales manager in nonferrous products, particularly in specialty bronzes, including steel and rolling mill equipment. The company has a laboratory for chemical and metallurgical control of its products, in charge of Bruno Woyski.

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Heil Co., 3000 West Montana street, Milwaukee, has expanded its oil burner division to include oil-burning boilers and warm air furnaces for dwellings. Joseph F. Heil is vice president.

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Lincoln Steel Products Corp., 60 East Forty-second street, New York, has been formed for domestic and export trade in new, surplus and defective steel materials and metals. The company includes Emanual Voss, M. W. Amberg, W. C. Hays and C. H. Brushaber.

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Reliance Steel Corp., Detroit, has moved into its new warehouse at 2500 West Jefferson avenue from its former quarters in the plant of the Modell-Friedman Steel Corp., with which company it was affiliated. The new quarters provide about 30,000 square feet of floor space for its stock of strip steel coils. The company is distributor for American Rolling mill Co., Middletown, O. Sol Friedman is president, Louis Modell vice president, Arthur L. Tushbant secretary, and Harry Barnett treasurer.

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S. K. F. Industries Inc., New York, has established a branch store at 407 South Fourth street, Minneapolis, in charge of A. Kishkunas. Complete stock will be carried of ball and roller bearings, pillow blocks and hangers, to provide immediate service.

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Columbia Tool Steel Co., Chicago Heights, Ill., has moved its branch office and warehouse in Chicago to larger quarters at 326 North Western avenue. The new location makes available 5500 square feet of space and more complete stocks of tool steel will be carried. Thomas G. Dougall is in charge.

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Wachs-Gregg & Co., Chicago, machine tool dealers, are moving their offices and display rooms to their own building at 1535 Dayton street, where larger facilities have been made available. The company recently was located at 117 North Jefferson street, Chicago.

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Pittsburgh Piping & Equipment Co., Pittsburgh, is low at $432 for furnishing 44 gate axle rings and washers to the Pittsburgh federal engineers, as repair parts for locks 7, 9, 10 and 12 in the Ohio river.

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Carboloy Co. Inc., New York, manufacturer of carboloy cemented carbide tools and dies, reports orders entered for January, 1935, represent an increase of 125 per cent over January, 1934. Men on payroll Jan.

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31, 1935, were 86 per cent greater than on the same date in 1934. A feature of the increase is larger use of special types of tools, indicating steadily increasing knowledge on the part of industry of the special requirements of carboloy use.

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Moe-Bridges Co., 220 North Broadway, Milwaukee, manufacturer of electric light fixtures, has been succeeded by the Moe-Bridges Corp., organized by S. Deutsch and associates. The business will be continued in Milwaukee. Mr. Deutsch is president of the Electric Sprayit Co., South Bend, Ind., which will be transferred to Milwaukee and operate in the Moe-Bridges plant.

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Worthington Pump & Machinery Corp., Harrison, N. J., has bought from Detroit Electric Furnace Co., Detroit, a 1000-pound Detroit rocking electric furnace for the foundry at its works at Buffalo. It will be used in producing high-quality ferrous castings for diesel engines and compressors.

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Boiler Engineering Co., Newark, N. J., former builders of Beco-Turner baffle walls for water tube boilers, has discontinued business and Plibrico Jointless Firebrick Co., Chicago, has taken over installation of these walls. The engineering and installation staff of the Boiler Engineering Co. has been absorbed.

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Standard Fuel Engineering Co., 667 Post avenue, Detroit, has installed a rotary dryer in which all clays used in manufacture of its cements are completely dried before being ground to the proper mesh. This equipment will increase production and continue quality of the product.

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Thomas & Armstrong Mfg. Co., London, O., manufacturer of sheet metal products, has been bought by Tanda Steel Products Inc., Columbus, O. The plant at London will be continued in operation, as the Thomas & Armstrong Co., with E. E. Walker, formerly associated with the Brown Fence & Wire Co., Cleveland, as general manager.

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Michael Yundt Co., Waukesha, Wis., builder of automatic machinery for dairies, breweries and similar uses, has booked an order from Barclay, Perkins & Co. Ltd., London, Eng., for a large size airbrush bottle-washing unit, six of which have been bought by this company previously. Another order for the same kind of unit has been booked for the Dairymen's League Co-operative Association, New York.

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Timken Roller Bearing Co., Canton, O., has taken an order for bearings for the new Zaporojstal steel mill recently ordered for the U. S. S. R. by the Amtorg Trading Corp., from the United Engineering & Foundry Co., Pittsburgh. The order will cover about 1500 bearings, weighing about 200 tons, from one pound to four tons each. They will be used on the roll necks of the backup and work rolls of the 4-high hot strip mill, backup roll necks of tandem cold strip mill and reversing cold strip mill, single stand reversing cold mill, two-high cold skin pass mill and cold sheet planishing mill. Timken bearings will also be used on tables and table drives, screwdowns, gear drives, coilers and uncoilers and pinion stands.

Basing Point Gets Into Politics

(*Continued from Page* 25)

method of quoting prices is so deeply rooted in the steel industry, is found in the effects of transportation charges on the cost of steel products to users. Most of the common classes of steel products are of comparatively low value in proportion to weight, and freight charges for shipments over any considerable distances, therefore, may be equal to a substantial fraction of the total value of the product shipped.

"As a result, the comparative costs of delivery from different sources of supply to any purchaser of steel products would largely determine the limits of competition, if there were not provided some way of equalizing such transportation costs, as among various producers who may wish to compete for the business of any given user of steel.

"For various reasons, many producers of steel products have plants that are located in places which are not close to the chief markets for their products. This condition is espeially true of many, if not most, of the smaller producers in the ndustry. Conversely, many users of steel have plants located in places which are remote from their best or preferred sources of steel products. Changing industrial conditions may have brought about these dislocations. Unless such producers and users of steel are to be at serious competitive disadvantages in their respective industries, some way of equalizing freight costs on shipments of steel products must be available.

"The basing point method is the only one providing a convenient and flexible means of equalizing costs of delivery which have to be borne by the purchaser of steel. By the adoption and use of that method, the steel industry has increased the freedom of competition among all producers of any class of product at any given place of consumption. At the same time, it has widened the range of available sources of supply from which any user of steel may satisfy his needs, without penalty of price. In effect, therefore, the tendency of the basing point method of quoting prices is to make actual costs of steel lower to the average user than otherwise would be the case.

"From the foregoing facts, therefore, the conclusion is clear that any action seeking to disturb the practice of quoting prices for steel products according to the long established basing point method would have the following results:

1. It would seriously decrease production in some of the largest producing centers, such as Pittsburgh and Youngstown.

2. It would tend to increase production at plants that are favorably located in or near the large centers of steel consumption.

3. Through the shifting of division of business, it would cause a prompt shifting of demand for labor and in-

stead of increasing employment it would have the opposite effect.

4. It would localize the relations of producers and consumers of steel products and thereby lead to the dismantling of plants so located that they could no longer reach the markets on which their business had been built, with attendant loss to the owners and permanent destruction of employment for steel workers in those places.

5. It would deprive the purchaser of steel products of the advantages of several sources of supply at competitive prices, and put him generally at the mercy of the nearest mill."

Equipment

Chicago — Inquiries for certain types of plant equipment are more active and an increased disposition is noted on the part of manufacturing plants to consider rehabilitation of existing equipment and additions of new units. Bids have closed on a large number of tools for the Rock Island, Ill., arsenal, and early placing of this business is anticipated. Steel plants are active in connection with improvements and additions to rolling mill facilities but have done little buying of small tools.

Pittsburgh—Continental Roll & Steel Foundry Co., East Chicago, Ind., has been awarded contract for a three-high, breakdown mill to be installed in the reconditioned plant about to be occupied by the Niles Rolling Mill Co., Niles, O. Contracts for supplying the automatic feeder, catching and shear equipment were awarded recently to Wean Engineering Co. Inc., Warren, O.

New York—Inquiry for machinery is less active, heavy requirements for the government on which bids closed last week being an exception. Private industry buying has slowed up slightly with uncertainty more evident. Activity in the Philadelphia district leads that here, both industrial and government buying. Bids close March 27 with the bureau of yards and docks, Washington, on a 10-ton electric bridge crane and four 2-ton electric monorail hoists for the naval aircraft factory, Philadelphia. In addition, inquiries are also being issued for other equipment for this plant which will eventually take a large number of metalworking tools.

Seattle—University of Washington regents will receive bids April 3 for power plant improvements, to cost $142,000, including machinery and equipment. Plans are by G. H. Kreuger, 403 Douglas building here. Bids have been opened at Fort Peck, Mont., for two cranes mounted on diesel crawler-type tractors.

Boston—Including heavy requirements for arsenal and government shops, machinery and equipment builders have figures in on a large volume. Orders are generally in small lots, one or two tools at a time, but such buying is gradually broadening in the industrial field. American Steel & Wire Co., Worcester, Mass., is installing four new bell-type electric furnaces for the annealing of coiled strip, two purchased from the General Electric Co. and two from the Westinghouse Electric & Mfg. Co. Bids close March 26 on a squaring shear, vertical shaper and balancing machine for delivery at the Portsmouth, N. H., navy yard and a universal punch and shear and one forging hammer for the Boston yard. Bureau of supplies and accounts, navy department, will place the orders.

Construction and Enterprise

Michigan

BIG RAPIDS, MICH.—City is contemplating the construction of a hydro-electric power plant.

DETROIT—Thomas Welding Laboratories Inc., 1117 Penobscot building, has been incorporated with $15,000 capital to deal in steel, by H. C. Grossman, Pontiac, Mich.

GRAND RAPIDS, MICH.—Michigan Bumper Co. has acquired the assets of the Wolverine Bumper & Specialty Co. Albert P. Crell, founder of the Wolverine company, will continue as president of the new organization. About $50,000 will be expended for plant additions and improvements.

JACKSON, MICH.—Hinckley Myers Co. is planning to erect an addition and make alterations to its plant this spring.

KEELER, MICH.—Cookware Co., Van Buren county, Hartford, Mich., is having private plans completed for a $20,000 factory building to be built here.

MUSKEGON, MICH. — Enterprise Brass Works Corp. has been incorporated to operate a foundry and machine shop, by Frank Holt, Muskegon, Mich.

NEGAUNEE, MICH.—Architect John D. Chubb, 109 North Dearborn street, Chicago, has plans under way for a third story addition to the vocational training school and a new grade school, costing together $240,000.

REMUS, MICH.—Remus Community club is contemplating construction of a water system and sewage disposal plant for the village of Remus, costing $22,000 and $40,000 respectively.

SAGINAW, MICH.—Francis Engineering Co. has completed plans for a $35,000 sewage plant and pumping station to be erected at Spring Lake.

SAGINAW, MICH.—Saginaw Stamping & Tool Co., 68 Williamson street, has been incorporated with $150,000 capital to engage in tool machine stamping business, by A. R. Pribil, Saginaw, Mich.

ST. CLAIR, MICH.—S. H. Zimmerman, general superintendent, Crystal Salt Co., reports construction of two new buildings and repair of several structures, involving a total of $225,000, will be completed by June.

Massachusetts

BOSTON—Bureau of supplies and accounts, navy department, Washington, will open bids March 26, schedule 4514, for one motor-driven universal punch and shear machine, delivery Boston.

BOSTON—Quartermaster depot, army base, will open bids March 28, circular 96, for ten bench vises, 14 creepers, four

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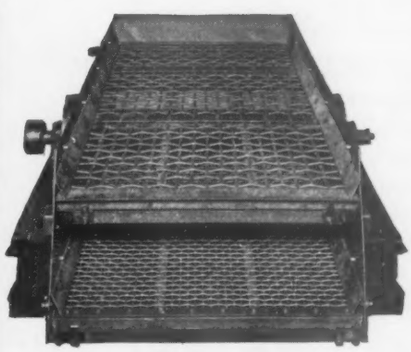

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New Hampshire

PORTSMOUTH, N. H.—Bureau of supplies and accounts, navy department, Washington, will take bids March 26, schedule 4515, for one metalworking vertical universal shaper; schedule 4520, for one motor-driven balancing machine, both delivered here.

New York

BROOKLYN, N. Y.—Bureau of supplies and accounts, navy department, Washington, will open bids March 26, schedule 4522, for a spiral gear generating machine and equipment, delivered here.

LONG ISLAND CITY, N. Y.—Playing card division of the Gibson Art Co. has leased 50,000 square feet in the American Chicle building, 30-30 Thomson avenue. Equipment for the manufacture of playing cards will be installed.

NEW YORK—Maurice P. Davidson, commissioner of water supply, gas and electricity, city hall, has announced that plans for the municipally-owned and operated light and power system are to be submitted to the board of estimate within a week or two. (Noted Dec. 24)

ROCHESTER, N. Y.—Eastman Kodak Co. has awarded contracts for construction of a large addition to its plant in Kodak Park here.

New Jersey

DOVER, N. J.—Dover Boiler Works recently was damaged by fire which started in the tool room.

NEWARK, N. J.—Steel & Alloy Tank Co. has been organized to manufacture iron and steel products. Fred Herrigel Jr. is agent.

Pennsylvania

PHILADELPHIA—Bureau of supplies and accounts, navy department, Washington, will take bids March 26, schedule 4525, for one motor-driven head stock type lathe; schedule 4526, one motor-driven grinder; schedule 4527, one motor-driven horizontal hydraulic broaching machine; schedule 4529, one motor-driven plain milling machine, all delivered at Philadelphia.

Ohio

CLYDE, O.—Clyde Motor Products Co. has purchased the former Clydesdale Co. and will soon begin manufacture of Clydesdale diesel engine motor trucks.

TOLEDO, O.—American Brake Shoe & Foundry Co., 230 Park avenue, New York, has acquired the plant of the Railway Materials Corp. here and will remodel it into a brake shoe factory. It is also carrying out an expansion and improvement program at its Southern Wheel Co. plant here, with expenditures of $400,000.

Illinois

BLOOMINGTON, ILL.—Bloomington *Daily Pantagraph* is planning to erect a plant to cost $200,000, exclusive of equipment. Included in the structure will be heating and ventilating units, comprising filters, humidifiers and refrigerators.

CHICAGO—National Copper Paint Co., 666 Lake Shore drive, is planning the addition of more manufacturing units. L. D. Pangborn is plant manager.

CHICAGO—Vulcan Stamping & Mfg. Co., 4036 West Lake street, has purchased an additional manufacturing plant on Madison street near Twenty-fifth avenue, to be used for production of pails, cans and other types of containers.

CHICAGO—Tennyson Mfg. Co., 220 West Huron street, has been incorporated by Emil Errico, Milton Peterson and Earl H. Tennyson, to manufacture coin operated machines. Correspondent: William P. Fortune, 1445 First National Bank building.

PEORIA, ILL.—J. I. Case Co., Racine, Wis., manufacturer of tractors and agricultural machinery, will soon take bids for reconstruction of its 2-story Peoria warehouse and distributing plant, 90 x 130 feet. Frank J. Hoffman, Janes block, Racine, Wis., architect.

Alabama

BIRMINGHAM, ALA.—Birmingham Paper Co., T. Marcus McClellan vice president, 2101 Fifth avenue, South, is installing new machinery at a cost of $22,000, to double capacity of plant.

BIRMINGHAM, ALA. — The new warehouse being built here by the Pittsburgh Plate Glass Co., Grant building, Pittsburgh, will be ready for occupancy about April 1, as reported by J. M. Phillips, district manager. The building is 1-story, 100 x 300 feet, and will cost approximately $55,000. (Noted Jan. 28.)

MOBILE, ALA.—Bush Bros. & Co., Brook and Woodlawn streets, Louisville, Ky., are considering establishing a plant here for sawing logs into blocks of 50 dimensions.

Delaware

WILMINGTON, DEL.—E. I. du Pont de Nemours & Co. is planning to expand its activities in Argentina. A new company will be formed to be known as Ducilo, S. A., Productora de Rayon, which will engage in manufacture of viscose rayon. A plant will be purchased near Buenos Aires.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids March 26, schedule 4491, for a motor-driven metal cutting band saw, delivery Mare Island.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids, March 26, schedule 4507, for one electric crane, delivered here; March 29, schedule 4537, rough machined steel forgings, delivered at Brooklyn, N. Y., and Philadelphia.

Florida

ST. PETERSBURG, FLA.—Charles H. Harvey, Hotel Seneca, is planning to erect a $25,000 cold storage, ice cream and canning plant here.

Georgia

ATLANTA, GA.—David F. Rice, 588 Parkway drive, is considering establishing a small furniture factory either in Georgia or Florida and wants data and prices on machinery and equipment.

Maryland

ANNAPOLIS, MD.—Annapolis metropolitan commission, J. Garland Healy, chairman, will have plans ready for bids in April for pumping station and equipment. Robert Burwell, engineer, Annapolis, Md.

CAMBRIDGE, MD.—City will have plans ready for bids soon for sewer system, pumping station and sewage treatment plant, to cost about $260,000. Whitman, Requardt & Smith, consulting engineers, Southwest corner of Charles and Biddle streets, Baltimore.

ELKRIDGE, MD.—Board of Howard county commissioners, Ellicott City, Md., will open bids March 19 for sale of $80,000 bonds for construction of water distribution system.

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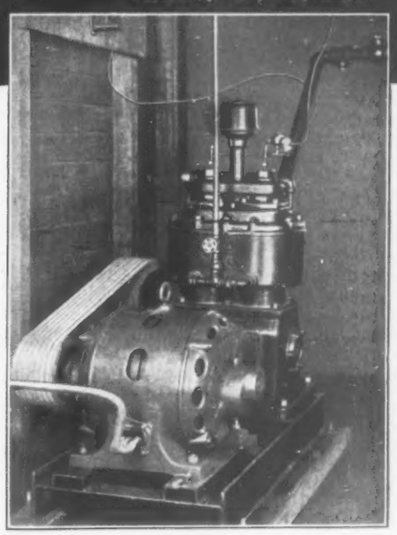

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Mississippi

TUNICA, MISS. — Tunica Bottling Works, care of Marvin Ritchie, has acquired a site adjoining its present building for expansion purposes.

North Carolina

CHARLOTTE, N. C.—National Container Corp., Borden and Review avenues, Long Island City, N. Y., plans establishing a plant here for the manufacture of cardboard and other boxes and containers.

ELKIN, N. C.—Carolina Furniture Manufacturers Inc. is establishing a plant to manufacture four poster beds and novelties. Machinery will be installed.

STATESVILLE, N. C.—Home-Made Chair Co. Inc. has been formed with $100,000 capital by J. Murdock and L. O. Gibson, to operate a woodworking plant.

South Carolina

COLUMBIA, S. C.—Wallace Concrete Pipe Co., Lincoln and Tobacco streets, is erecting a 50-ton capacity concrete pipe plant, and will install a small electric spot welding machine.

COLUMBIA, S. C.—State legislative committee is applying to PWA for allotment of between $1,000,000 and $1,500,000 for constructing new state prison plant. Committee is composed of Senators Edgar A. Brown, Barnwell, S. C., and J. D. Pruitt, Anderson, S. C., and Representative R. G. Blackburn, Marion, S. C.

Virginia

LYNCHBURG, VA.—A. B. Dabney, 125 Easton avenue, has acquired the former plant of the Hubard Foundry & Machine Works and will operate it as the Dabney Foundry & Machine Works Inc.

Missouri

ST. LOUIS—Monsanto Chemical Co., 1700 South Second street, has announced a $4,000,000 program in 1935 for replacement, extensions to existing plants, plant for new products and auxiliary facilities.

Arkansas

OSCEOLA, ARK. — City, Mayor Rogers, will expend $15,000 for purchase of engine for power plant.

Texas

PORT ISABEL, TEX.—City is receiving bids for waterworks system, costing about $40,000. W. E. Anderson, engineer, San Benito, Tex.

MANOR, TEX.—J. C. Acklin, city secretary, will receive bids March 22 for installing waterworks. Work includes complete distributing system, pumping station, elevated tank and tower and 3500-foot water well and equipment. Grant of $42,000 has been approved.

TILDEN, TEX.—McMullen county, Clifton Wheeler county judge, is receiving bids for erecting a power plant at McMullen county courthouse.

Wisconsin

CAMPBELLSPORT, WIS.—Bids close March 26 for construction of a $58,000 water plant and a $60,000 sewerage system, according to plans by Jerry Donohue, 608 North Eighth street, Sheboygan, Wis. James Farrell is village clerk.

MADISON, WIS.—Madison Packing Co., 307 West Johnson street, has awarded contract for remodeling and alterations to packing plant.

MILWAUKEE—Line Material Co., South Milwaukee, has received an order from the city of Knoxville, Tenn., for electric power distribution equipment amounting to $123,000.

MILWAUKEE—Jacobs Metals Corp. has been incorporated by Harry Primakow, and Charles and Leo D. Swiller.

MILWAUKEE—Harnischfeger Corp., 4411 West National avenue, is about to start work on a private plant hospital. 35 x 45 feet, to cost about $25,000 with complete equipment.

MILWAUKEE—Tractor division of the Allis-Chalmers Mfg. Co., West Allis, Wis., will purchase a large hydraulic press, in addition to four drill presses, an engine lathe and other equipment recently contracted for.

MILWAUKEE — Whirlwind Lawn Mowers Corp., New Orleans, maker of power lawn mowers, is moving its business to Milwaukee. Manufacturing and assembly space has been leased at 158 North Milwaukee street. W. S. Watrous is president.

MINOCQUA, WIS.—Bids will be received until March 22 for construction of a sewage disposal plant, including sludge pump, two sewage ejectors with air compressing equipment, etc. Suhr, Berryman, Peterson & Suhr, 130 North Wells Street, Chicago, are engineers.

PRINCETON, WIS.—A special election will be held April 2 on bond issue to meet federal loan and grant of $100,000 for constructing a waterworks and sewerage plant system. A. E. McMahon, Menasha, Wis., is consulting engineer.

RACINE, WIS.—Racine Iron & Wire Works, 901 Prospect street, has awarded contract for construction of a 1-story factory, 47 x 117 feet.

SUPERIOR, WIS.—Chicago, St. Paul, Minneapolis & Omaha railroad, is planning to rebuild its 15-stall roundhouse recently damaged by fire.

Minnesota

ALBERT LEA, MINN.—Wilson & Co., meat packer, Chicago has awarded contract for construction of a fertilizer manufacturing plant, 50 x 100 feet.

Iowa

SIOUX CITY, IOWA—Haakinson-Beatty Co. has been incorporated with capital stock of $100,000 to do structural steel fabricating, by Carl E. Haakinson, John W. Anderson and Robert I. Beatty.

Nebraska

NORTH PLATTE, NEBR. — Platte Valley Public Power and Irrigation District, Gerald Gentleman secretary, will receive bids until March 22 for a 15,000-volt metal clad switchgear and accessories, consisting of two 1200-ampere and six 600-ampere, 15,000-volt, indoor type totally enclosed metal clad switchgear bays and accessories.

WAYNE, NEBR.—City council will soon take bids for diesel oil burning engine and generator for the municipal power plant to cost about $55,000. W. S. Bressler is city clerk.

Colorado

DENVER—Bureau of reclamation, will open bids March 20, specification 666-D, for one electric water heater with tank and motor-driven circulating pump, two 30-gallon and one 120-gallon electric storage water heaters, seven electric water coolers, three-gallon per hour capacity, and four electric water coolers, 6.5 gallon per hour capacity, for installation in the Boulder power plant project.

Montana

FORT PECK, MONT.—Capt. Theodore Wyman Jr., United States engineer corps, 707 Postal Telegraph building, Kansas City, Mo., will receive bids until April 3 for gate structure, cutoff structure and appurtenant works for the Fort Peck dam spillway, including 1060 tons of structural steel for vertical lift gates, 121 tons of structurals for stop logs and lifting beams, 778 tons of steel for service bridges, 1250 tons of steel for bracing, 70 tons of steel rail for service bridges, 600 tons of miscellaneous steel, and 11,100 tons of reinforcing bars.

Pacific Coast

CALEXICO, CALIF.—Henry Allen, metallurgical engineer, Dool building, will direct the operations of the Occidental Mining & Commercial Co. in the development of two sulphur mines in the Cocopah range, south of Mexicali, Baja, Calif.

MARE ISLAND, CALIF.—Bureau of supplies and accounts, navy department, Washington, will open bids March 29, schedule 4525, for one motor-driven grinding and polishing machine; schedule 4516, one motor-driven sheet metal nibbler machine, both for delivery here.

ALMIRA, WASH.—Bids will be asked soon for a $25,000 water system project, including an 80-foot steel tower, pumps, etc. Plans have been prepared by Otto Weile, Spokane, Wash., engineer.

EVERETT, WASH.—H. M. Robbins, president, North Star Lumber Co., announces his company may use a site on the local waterfront for construction of a pulp mill. Eastern capitalists are reported to be interested.

SEATTLE—Coos Bay Pulp Corp. has been incorporated with $500,000 capital by W. L. Raymond, K. O. Fosse and H. T. Sprague, 1006 Hoge building.

SEATTLE—Seattle Box Co., 401 Spokane street, is planning construction of a drying shed and other improvements, including an overhead crane.

SEATTLE—Western Containers Inc., 4634 East Marginal way, has awarded contract for construction of a 75 x 120 foot extension to its plant.

SEATTLE—Union Oil Co. has begun expenditure of $150,000 in construction of 30 service stations in Washington and Oregon.

SEATTLE—Century Brewing Co., 3100 Airport way, has plans completed for construction of a 4-story, 53 x 83 foot, reinforced concrete addition to its plant. Equipment will include 69 steel tanks and 24 fermenting vats.

SEATTLE—Extensions and improvements costing $60,000 are under way at plant of Hemrick Brewing Co., 5225 East Marginal way. Work includes new bottling plant, and new tanks and equipment, increasing annual capacity by 30,000 barrels.

TACOMA, WASH.—Balancing Service Co. has been incorporated to manufacture machines, tools, and mechanical devices, by H. O. Hanawalt, Thomas W. Skinner and A. E. Blair.